MEU 1-5-89

1525

NUS CORPORATION

1927 LAKESIDE PARKWAY
SUITE 614
TUCKER, GEORGIA 30084
404-938-7710

C-586-12-8-103

December 23, 1988

Mr. Narindar Kumar
Site Investigation and Support Branch
Waste Management Division
Environmental Protection Agency
345 Courtland Street, N. E.
Atlanta, Georgia 30365

Date: 1/4/88
Site Disposition: NFRMP
EPA Project Manager: K. Lucas

Subject: Preliminary Reassessment
Textron, Inc.
Augusta, Richmond County, Georgia
GAD003302064
TDD No. F4-8804-65

Dear Mr. Kumar:

FIT 4 conducted a preliminary reassessment of Textron, Inc., in Augusta, Richmond County, Georgia. The reassessment included a review of EPA and state file material, completion of a target survey, and an offsite reconnaisance of the facility and the surrounding area.

Textron, Inc. is permitted to store paint waste, solvent waste and trivalent chromium sludge on site that is generated from the manufacturing of golf carts. This facility is regulated as a Treatment/Storage/Disposal (TSD) facility by the Georgia Environmental Protection Division under the authority of the Georgia Hazardous Waste Management Act (GHWMA) (Ref. 1). From 1977 to 1980, Textron, Inc. operated an evaporation tank to remove water from trivalent chromium sludge. This tank was abandoned on November 18, 1980 and was secured with an 8-foot chain-link fence. Textron, Inc. contracted Applied Engineering and Science to clean the inactive evaporation tank (Ref. 2).

Textron, Inc. is adjacent to the floodplain of the Savannah River, within the Fall Line Hills district of the Coastal Plain Physiographic Province. The area is underlain by alternating layers of clay, sand and gravel of the Gaillard Formation and possibly alluvium of the Savannah River. The two units unconformably overlie crystalline basement rock of the Piedmont Province and have a combined thickness of over 150 feet. The permeable section of the Gaillard make up the basal Cretaceous aquifer and the upper Cretaceous aquifer (Ref. 3). The net annual precipitation in the Richmond County area is two inches (Ref. 4).

The basal Cretaceous aquifer is the major aquifer for municipal, industrial and domestic supply for the Richmond County area. Groundwater within the aquifer in the vicinity of the facility occurs under artesian conditions. Aquifer thickness is estimated to be 87 feet in the vicinity of Textron, Inc. A red, sandy clay separates the basal Cretaceous aquifer from the upper Cretaceous aquifer and ranges from 7 to 60 feet in thickness. At the site, this clay is about 33 feet thick. Aquifer tests

POOR LEGIBILITY

PORTIONS OF THIS DOCUMENT MAY BE UNREADABLE, DUE TO THE QUALITY OF THE ORIGINAL

performed in the area indicate the confining bed to be leaky with a vertical hydraulic conductivity that ranges from 9.3 x 10^{-8} ft/s to 1.6 x 15^{-6} ft/s. Transmissivity of the basal Cretaceous aquifer ranges from 2.0 x 10^{-1} ft ^{2}/s to 2.6 x 10^{-2} ft^2/s (Ref. 3).

The upper Cretaceous aquifer is not extensively developed in the Richmond County area due to its proximity to the ground surface. Groundwater within the aquifer in the vicinity of the facility occurs under water-table conditions, but discontinuous clay layers in the upper sections of the aquifer may produce locally confined conditions. Aquifer thickness is estimated to be 33 feet in the vicinity of the facility. Due to similar lithologies between the Gaillard Formation and the Savannah River alluvium, the two units cannot be distinguished from one another and are considered to be one hydrologic unit (Ref. 3).

Groundwater flow in both aquifers is generally to the east-southeast, toward the Savannah River, but locally may be toward a cone of depression in the potentiometric surface of the basal Cretaceous aquifer, located west of the Bush Airfield. Recharge to the two Cretaceous aquifers occur by infiltration of precipitation in the outcrop area of the aquifer sediments and from leakage through overlying clay units. Natural discharge is into the Savannah River and into creeks and streams where aquifer sediments are close to the land surface (Ref. 3).

Richmond County is served by the Richmond County Water System which has 25 wells that are interconnected. The total depths of these wells range from 84 feet to 312 feet (Ref. 5). The nearest municipal well to the facility is well #15 which is completed at 130 feet below land surface (bls), and it is located approximately 8000 feet west of the facility (Ref. 7, 8). The Richmond County Water System supplies potable water to 22,000 connections (22,000 x 3.8 = 83,600 persons) (Ref. 9). Since the major aquifer for the municipal, industrial, and domestic water supply for the Richmond County area is the basal Cretaceous aquifer, it is considered to be the aquifer of concern. Additionally, there are residents utilizing wells for drinking water between three and four miles south of the site (Ref. 5).

The city of Augusta obtains its water from an intake at the Augusta City Lock and Dam along the Savannah River which is located 11 miles north-northwest and upstream of the facility in question (Ref. 5).

Overland runoff from the facility travels southward for 3,000 feet, and then enters Butler Creek (Ref. 7). People fish frequently at the confluence of Butler Creek and the Savannah River which is 3.5 stream miles downstream of the facility (Refs. 7, 10). Additionally, there is an intermittent stream leading from the north side of the facility boundary to Phinizy Swamp (Ref. 7). Phinizy Swamp is fished to a very limited extent by local landowners and nearby residents (Ref. 10).

The individuals having the greatest risk of onsite exposure are the employees of the surrounding businesses (Ref. 5).

Mr. Narindar Kumar
Environmental Protection Agency
TDD No. F4-8804-65
December 23, 1988

Any releases of hazardous wastes at this facility are regulated as a "prior release" under GHWMA, and all corrective action will be negotiated through the Part B Permit review process (Ref. 1). Based on the enclosures and the above-referenced material, it is recommended that no further remedial action be planned at Textron, Inc.

If you have any questions regarding this site, feel free to contact me at NUS Corporation.

Very truly yours,

Daniel L. Howard

Daniel L. Howard
Chemist

Approved:

DLH/kw

Enclosures

cc: Mario Villamarzo

REFERENCES

1. Potential Hazardous Waste Site Preliminary Assessment (EPA Form 2070-12), cover sheet and attachments for Textron, Inc. Filed by Alan R. Laros, Environmental Protection Systems, August 12, 1985.

2. EPA Notification of Hazardous Waste Site (EPA Form 8900-1) with attachments, for Textron, Inc., Augusta, GA. Filed by Charlie Grimes, present owner, July 27, 1983.

3. L. L. Gorday, "The Hydrologeology of the Coastal Plain Strata of Richmond and Northern Burke Counties, Georgia", Information Circular 61 (Georgia Geologic Survey, 1985).

4. U.S. Department of Commerce, Climatic Atlas of the United States, (Washington, D.C.: GPO, June 1968) Reprint: 1983, National Oceanic and Atmospheric Administration.

5. NUS Corporation Field Logbook No. F4-840 for Textron, Inc., TDD No. F4-8804-65. Documentation of facility reconnaissance, May 3-5, 1988.

6. David Hargrove, James G. Swift and Associates Consulting Engineers. for Richmond County, telephone conversation with David Upthegrove, NUS Corporation, September 12, 1988. Subject: Aquifer from which the Richmond County wells produce from.

7. U. S. Geological Survey, 7.5 minute series Topographic Quadrangle Maps of Georgia: Augusta West 1957 (Photorevised 1980), Augusta East 1965 (PR 1981), scale 1:24000.

8. Richmond County Water System, well location table, 1987.

9. Brian Richards, Assistant Superintendent, Richmond County Water System, telephone conversation with Robert Hutcheson, NUS Corporation, June 8, 1988. Subject: Water distribution by the Richmond County Water System.

10. Detles Holderfield, Conservation Ranger-1st class, Georgia Game & Fish Division, telephone conversation with Steve Walker, NUS Corporation, June 10, 1988. Subject: Fishing locations in the Augusta area.

RCRA/NPL POLICY QUESTIONNAIRE FOR INITIAL SCREENING

Site Name: Textron, Inc.

City: Augusta State: Georgia

EPA I.D. Number: GAD003302064

Type of Facility: Generator___ Transporter___ Disposal ✓
Treatment___ Storage (more than 90 days) ✓

I. RCRA APPLICABILITY	yes	no
Has this facility treated, stored or disposed of a RCRA hazardous waste since Nov. 19, 1980?	✓	
Has a RCRA Facility Assessment (RFA) been performed on this site?		✓
Does the facility have a RCRA operating or post-closure permit? If so, date issued SEPTEMBER 28, 1984	✓	
Did the facility file a RCRA Part A application?	✓	
If so:		
1) Does the facility currently have interim status?		
2) Did the facility withdraw its interim status?		
3) Is the facility a known or possible protective filer?		
Is the facility a late (after Nov. 19, 1980) or non-filer that has been identified by EPA or the State?		✓

STOP HERE IF ALL ANSWERS TO QUESTIONS IN SECTION I ARE NO

II. FINANCIAL STATUS		
Is the facility owned by an entity that has filed for bankruptcy under federal or State laws?		✓

III. RCRA ENFORCEMENT STATUS		
Has the facility lost authorization to operate or had its interim status revoked?		✓
Has the facility been involved in any other RCRA enforcement action?		

TEXTRON INC
GAD003302064
PRELIMINARY ASSESSMENT COVER SHEET

This facility is a Treatment/Storage/Disposal (TSD) facility that is regulated by the Georgia Environmental Protection Division under the authority of the Georgia Hazardous Waste Management Act (GHWMA). This facility presently has either Interim Status (Part A on file) or has a Hazardous Waste Facility Permit (Part B is complete). Any releases of hazardous wastes at this facility are regulated as a "prior release" under GHWMA and all corrective actions will be negotiated through the Part B Permit review process. This site is therefore assessed a "NONE" priority for a Site Inspection. No further investigations are recommended with respect to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

PMA/mcw008

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
GA	D003302064

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Textron, Inc.	1451 Marvin Griffin Road				
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 COUNTY**	**07 COUNTY CODE**	**08 CONG DIST**
Augusta	GA	30913	Richmond	245	10
09 COORDINATES LATITUDE: 33° 23' 55.0"	LONGITUDE: 081° 59' 26.0"				

10 DIRECTIONS TO SITE (Starting from nearest public road)

Take Bobby Brown Expressway east to Old Savannah Road- turn left onto Marvin Griffin Road, go approximately 1 1/2 miles - plant entrance on the left.

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)			
Textron Incorporated	40 Westminster Street			
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 TELEPHONE NUMBER**	
Providence	RI	02903	(401) 421-2800	
07 OPERATOR (If known and different from owner)	**08 STREET** (Business, mailing, residential)			
E-Z-Go Textron	1451 Marvin Griffin Road			
09 CITY	**10 STATE**	**11 ZIP CODE**	**12 TELEPHONE NUMBER**	
Augusta	GA	30906	(404) 798-4311	

13 TYPE OF OWNERSHIP (Check one)

☒ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL

☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

☐ A. RCRA 3001 DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION

☒ YES DATE 06 01 83 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR ☒ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)

CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)

☒ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION

_____ (BEGINNING YEAR) _____ (ENDING YEAR) ☒ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

This facility is permitted to store paint waste, solvent waste and trivalent chrome sludge on site (generated by plant operations).

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

All prior or continuing releases are regulated under the Georgia Hazardous Waste Management Act.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☒ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)			03 TELEPHONE NUMBER
Edwin Tiller	E-Z-Go Textron Inc.			(404) 798-4311
04 PERSON RESPONSIBLE FOR ASSESSMENT	**05 AGENCY**	**06 ORGANIZATION**	**07 TELEPHONE NUMBER**	**08 DATE**
Alan R. Laros	DNR	EPD-FCU	(404) 656-7802	08 12 85 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

J. Surovic

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
GA	D003302064

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- [ ] A SOLID
- [ ] B POWDER, FINES
- [ ] C SLUDGE
- [ ] D OTHER _____ (Specify)
- [ ] E SLURRY
- [ ] F LIQUID
- [ ] G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS 5 1/4

CUBIC YARDS _____

NO OF DRUMS 131-Max. Cap.

03 WASTE CHARACTERISTICS (Check all that apply)

- [X] A TOXIC
- [X] B CORROSIVE
- [ ] C RADIOACTIVE
- [ ] D PERSISTENT
- [ ] E SOLUBLE
- [ ] F INFECTIOUS
- [X] G FLAMMABLE
- [X] H IGNITABLE
- [ ] I HIGHLY VOLATILE
- [ ] J EXPLOSIVE
- [ ] K REACTIVE
- [ ] L INCOMPATIBLE
- [ ] M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	5 1/4	tons	treated annually
OLW	OILY WASTE			
SOL	SOLVENTS	10,165	gallons	annually
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analyses, reports)

GA EPD State Files
RCRA Part A Application

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
GA	D003302064

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) 04 NARRATIVE DESCRIPTION

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
GA	D003302064

II. HAZARDOUS CONDITIONS AND INCIDENTS *(Continued)*

01 ☐ J. DAMAGE TO FLORA
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ K. DAMAGE TO FAUNA
04 NARRATIVE DESCRIPTION *(Include name(s) of species)*

02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ L. CONTAMINATION OF FOOD CHAIN
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES
(Spills, runoff, standing liquids, leaking drums)
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ N. DAMAGE TO OFFSITE PROPERTY
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING
04 NARRATIVE DESCRIPTION

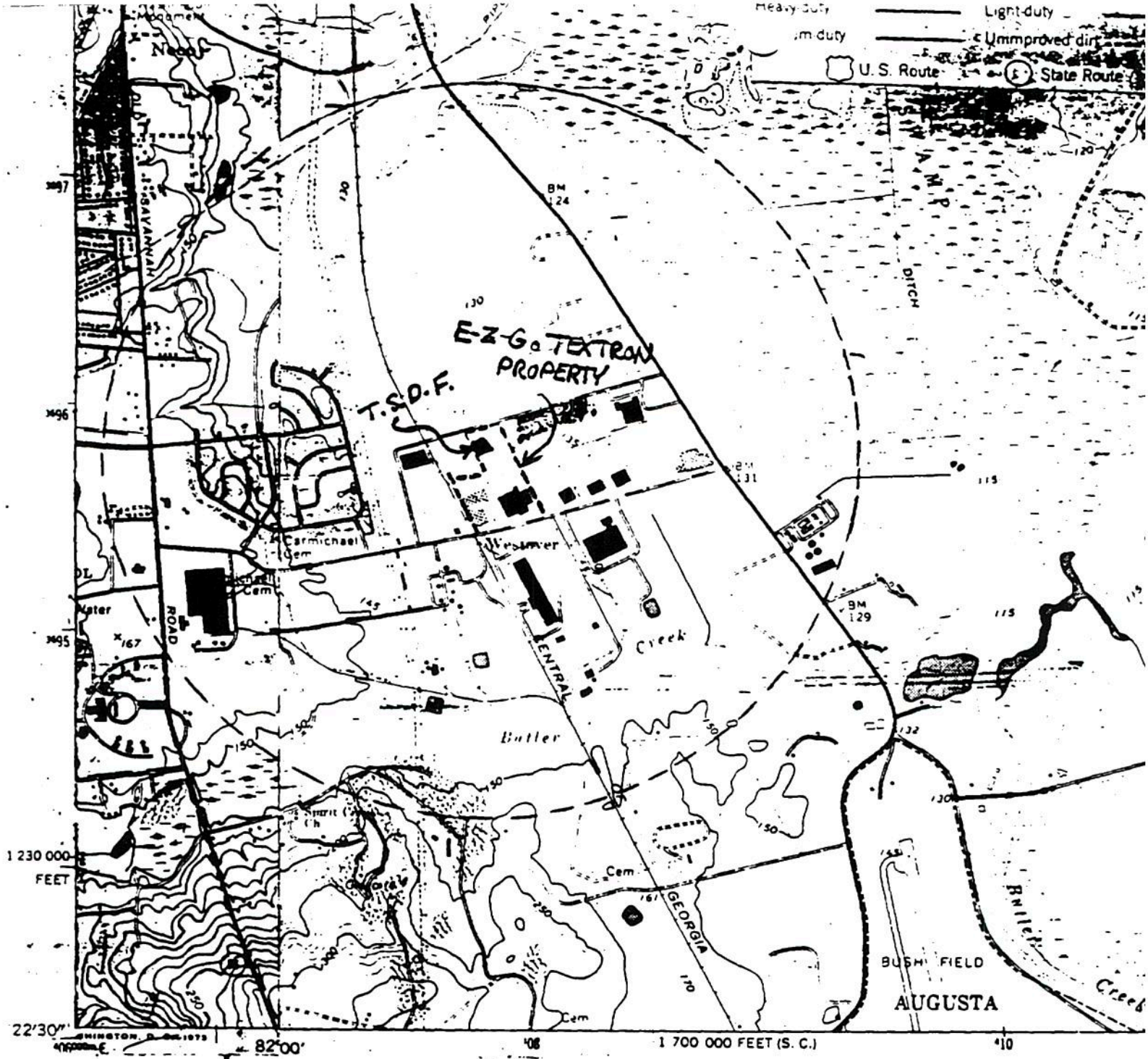
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*



Mapped, edited, and published by the Geological Survey

Control by USGS, USC&GS, USCE, Georgia Geodetic Survey, and South Carolina Geodetic Survey

Topography by photogrammetric methods from aerial photographs taken 1962 Field checked 1965

SCALE 1:24000

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

CONTOUR INTERVAL 10 FEET
DOTTED LINES REPRESENT 5-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

MN GN
14½° 27 MILS
0°31' 9 MILS

UTM GRID AND 1971 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

AUGUSTA WEST QUADRANGLE
GEORGIA
7.5 MINUTE SERIES (TOPOGRAPHIC)

AUGUSTA EAST QUADRANGLE
SOUTH CAROLINA—GEORGIA
7.5 MINUTE SERIES (TOPOGRAPHIC)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

E-Z-GO TEXTRON

E-Z-GO Division of Textron Inc.

P.O. Box 388
Augusta, Georgia 30913-2899
404 / 798-4311

July 26, 1983

RECEIVED
AUG 01 1983
ENVIRONMENTAL PROTECTION DIVISION
LAND PROTECTION BRANCH

Mr. Jim Ussery
Department of Natural Resources
Environmental Protection Division
270 Washington Street S.W.
Atlanta, Georgia 30334

Dear Mr. Ussery:

Enclosed is a completed copy of; Notification of Hazardous Waste Site, as you requested. Also enclosed is a letter from Augusta-Richmond County Planning Commission, concerning wells in the immediate area, along with,a proposal from Applied Engineering and Science for closure of the abandoned chromic facility.

I respectfully submit the above documents, along with this letter, as a request for "Closure" of this abandoned facility.

Should you have any questions concerning the above, please contact me.

Sincerely,
Charlie Grimes

Manager/Plant Engineering

EPA Notification of Hazardous Waste S

United States Environmental Protecti Agency
Washington DC 20460

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.

Please type or print in ink. If you need additional space, use separate sheets of paper. Indicate the letter of the item which applies.

REFERENCE 2

Person Required to Notify:
Enter the name and address of the person or organization required to notify.

Name E-Z-GO/Textron
Street 1451 Marvin Griffin Rd.
City Augusta State GA Zip Code 30913

Site Location:
Enter the common name (if known) and actual location of the site.

Name of Site E-Z-GO/Textron
Street Perkins Road
City Augusta County Richmond State GA Zip Code 30913

Person to Contact:
Enter the name, title (if applicable), and business telephone number of the person to contact regarding information submitted on this form.

Name (Last, First and Title) Grimes Charlie Mgr. Plant Eng.
Phone 404-798-4311

Dates of Waste Handling:
Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site.

From (Year) 1977 To (Year) 1980

Waste Type: Choose the option you prefer to complete

Option I: Select general waste types and source categories. If you do not know the general waste types or sources, you are encouraged to describe the site in Item I—Description of Site.

General Type of Waste:
Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

1. ☐ Organics
2. ☐ Inorganics
3. ☐ Solvents
4. ☐ Pesticides
5. ☐ Heavy metals
6. ☐ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Mixed Municipal Waste
10. ☐ Unknown
11. ☒ Other (Specify)

Chrome Trivalent

Source of Waste:
Place an X in the appropriate boxes.

1. ☐ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Fertilizer
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel Foundry
8. ☐ Chemical, General
9. ☐ Plating/Polishing
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Transformers
13. ☐ Utility Companies
14. ☐ Sanitary/Refuse
15. ☐ Photofinish
16. ☐ Lab/Hospital
17. ☐ Unknown
18. ☒ Other (Specify)

Metal Finishing (painting)

Option 2: This option is available to persons familiar with the Resource Conservation and Recovery Act (RCRA) Section 300 regulations (40 CFR Part 261).

Specific Type of Waste:
EPA has assigned a four-digit number to each hazardous was listed in the regulations under Section 3001 of RCRA. Enter t appropriate four-digit number in the boxes provided. A copy o the list of hazardous wastes and codes can be obtained by contacting the EPA Region serving the State in which the site located.

Form Approved
OMB No. 2000-0138

F Waste Quantity

Place an X in the appropriate boxes to indicate the facility types found at this site.

In the "total facility waste amount" space give the estimated combined quantity (volume) of hazardous wastes at the site using cubic feet or gallons.

In the "total facility area" space, give the estimated area size which the facilities occupy using square feet or acres.

Facility Type

1. ☒ Piles
2. ☐ Land Treatment
3. ☐ Landfill
4. ☐ Tanks
5. ☐ Impoundment
6. ☐ Underground Injection
7. ☐ Drums, Above Ground
8. ☐ Drums, Below Ground
9. ☐ Other (Specify) _____

Total Facility Waste Amount

cubic feet 800

gallons _____

Total Facility Area

square feet 195

acres _____

G Known, Suspected or Likely Releases to the Environment:

Place an X in the appropriate boxes to indicate any known, suspected, or likely releases of wastes to the environment.

☐ Known ☒ Suspected ☐ Likely ☐ I

Note: Items H and I are optional. Completing these items will assist EPA and State and local governments in locating and asse hazardous waste sites. Although completing the items is not required, you are encouraged to do so.

H Sketch Map of Site Location: (Optional)

Sketch a map showing streets, highways, routes or other prominent landmarks near the site. Place an X on the map to indicate the site location. Draw an arrow showing the direction north. You may substitute a publishing map showing the site location.

See Attachment No. : I

I Description of Site: (Optional)

Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.

See Attachment No. : II

J Signature and Title:

The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify. If you are not required to notify check "Other".

Name EZGO/Textron

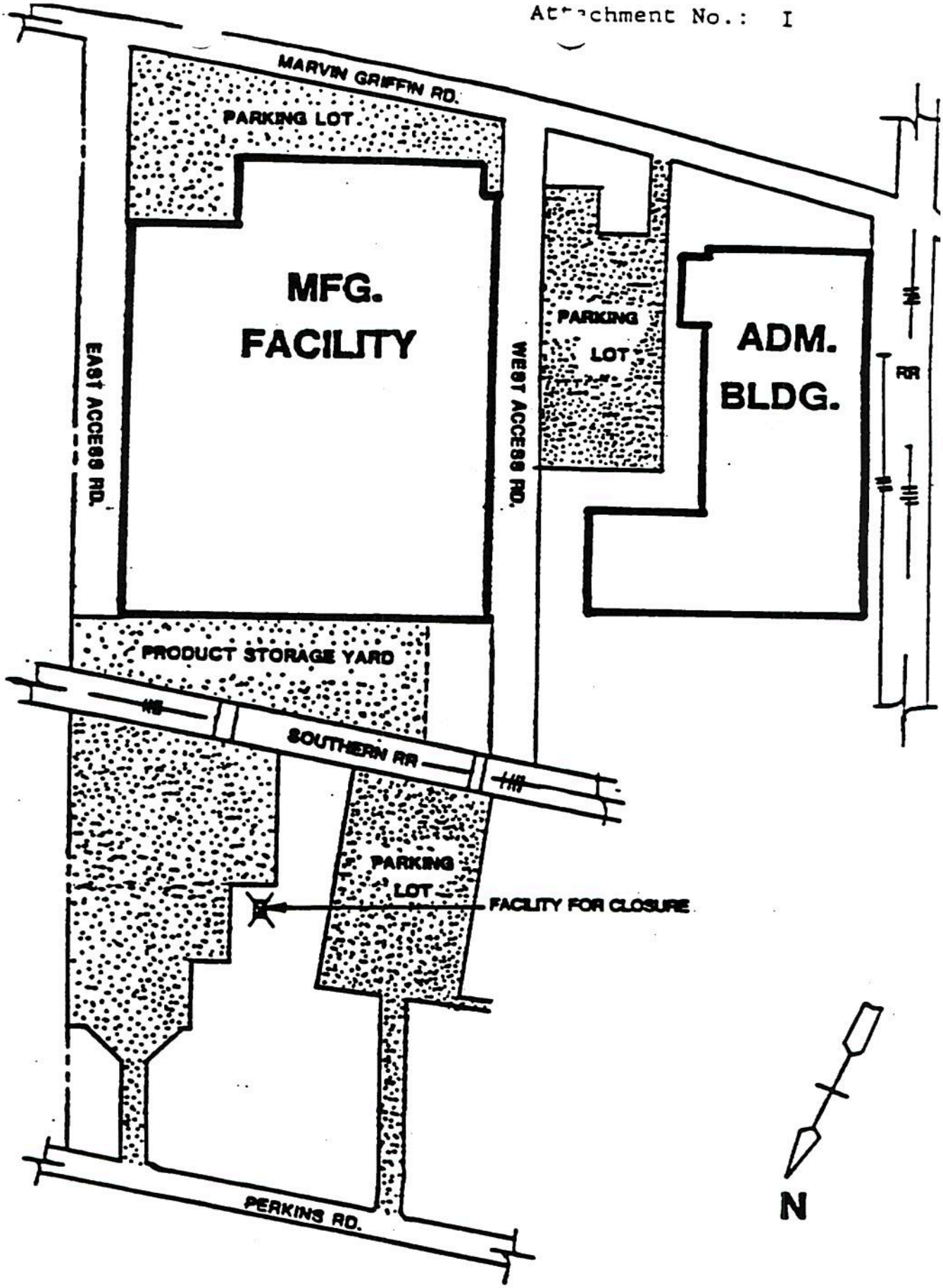
Street 1451 Marvin Griffin Road

City Augusta State Ga Zip Code 30913

Signature Charles C. [illegible] Date 7-27-83

☒ Owner, Pres
☐ Owner, Past
☐ Transporter
☐ Operator, Pre
☐ Operator, Pas
☐ Other

Attachment No.: I



SITE LOCATION

DESCRIPTION OF SITE

I- The pile measures appx. 17 feet in length, 9 feet in width, and 2 feet in height, constructed of 8 inch concrete block, and is filled with river washed sand for filter media. The facility was used as an evaporation tank (pile) to evaporate water from Chrome Trivalent Sludge. Chrome sludge was poured directly on top of the sand to allow dehydration.

This facility was abandoned Nov. 18, 1980, and was secured with a 8 foot high chain link fence, topped with 3 strands of barbed wire, and has one entry gate (pad locked).

It is located on a land parcel (owned by E-Z-GO) directly behind E-Z-GO manufacturing facility (see attachment No. I).

There are no known wells in the immediate area (see attached letter, dated 16 Sept. 1980-Augusta-Richmond County Planning Commission).

The nearest housing is located appx. 1,800 feet due west of the facility.

After dehydration the chromic residue (dry) was placed in 55-gallon drums. The drums (two each) are stored in E-Z-GO HWM facility at present.

The waste was generated (chromic acid) at the surface preperation facility (pre-treatment for painting), located in the manufacturing building.

AUGUSTA-RICHMOND COUNTY
PLANNING COMMISSION
DAYTON L. SHERROUSE, AICP
EXECUTIVE DIRECTOR
828 TELFAIR STREET
AUGUSTA, GEORGIA 30901
724-4391, EXT. 237

September 16, 1980

Mr. Daniel Didgeon
E-Z-Go Textron
P. O. Box 388 (13)
Augusta, GA 30913

Dear Dan:

In response to your request, I have checked our records and find no water wells within 1/4 mile of your plant located on Marvin Griffin Road. I also have checked with the Richmond County Board of Health, the Richmond County Water System and the Augusta Waterworks and none of these agencies show any evidence of wells located within the area.

Should you need additional information, please contact me.

Sincerely,

Dayton L. Sherrouse

Dayton L. Sherrouse, AICP
Executive Director

DLS/jg

APPLIED
ENGINEERING
AND SCIENCE

ENGINEERING AND
ENVIRONMENTAL
CONSULTANTS

June 23, 1983

Mr. Charles Grimes, Manager, Plant Eng.
E-Z-Go Division, Teatron, Inc.
Post Office Box 388
Augusta, Ga. 30903

Dear Mr. Grimes:

PROPOSAL FOR PROFESSIONAL SERVICES
Hazardous Waste Management Consulting
And Plan For Closure Of Inactive Chrome
Waste Facility.

We are pleased to submit this Proposal to you for consulting services at your Augusta Plant. This Proposal includes plans and estimated costs for closing the inactive chrome waste dr ing beds and for providing emergency spill response and othe hazardous waste management consulting as required.

As discussed in our June 17 meeting, we propose to prepare a plan for closure of the chrome drying beds. We have relied upon the information given us in that meeting to arrive at our proposed scope of activities and costs. We will first obtain and review available data on soils and groundwater in your area. We are now assuming that groundwater will be encountered at approximately 10 feet below the surface and that the upper soils are primarily clays and clayey sands. We will hand auger three test holes in order to collect sub surface soil samples at various depths to determine the actual amount of soil requiring removal. A limit of 5mg/liter i established for chromium in soils based on E P Toxicity. Aft receipt of analysis we will prepare the clean-up plan for you

We will assist as necessary in obtaining approvals and preparing documents for off-site disposal to an approved disposal site and supervise the clean-up. A preliminary cost estimate for excavation, transportation and disposal, based on an estimated quantity of 40 tons to be removed is $4,000 to $5,000. This assumes removal of all above ground material excavation of approximately 2 feet below the surface in the vicinity of the drying beds, and restoration of the area.

We will provide a final report of our findings with conclusions and recommendations.

We will perform these services at the attached AES per diem rates. Mileage and other expenses would be invoiced at cost times a 1.1 multiplier. The total cost for the Proposal will not exceed $4,700.00 to include engineering services of approximately $3,300, travel costs of approximately $600.00 and laboratory costs of approximately $800.00. We will bill monthl payable within 30 days.

We will also provide Emergency Spill Response consulting services on an as needed basis subject to availability of our experienced response staff members. For these services we will bill you on the basis of our Special Consultant Rate.

If you accept our Proposal we request that you send us a Purchase Order. We will be available to begin upon receipt of your order.

Sincerely,

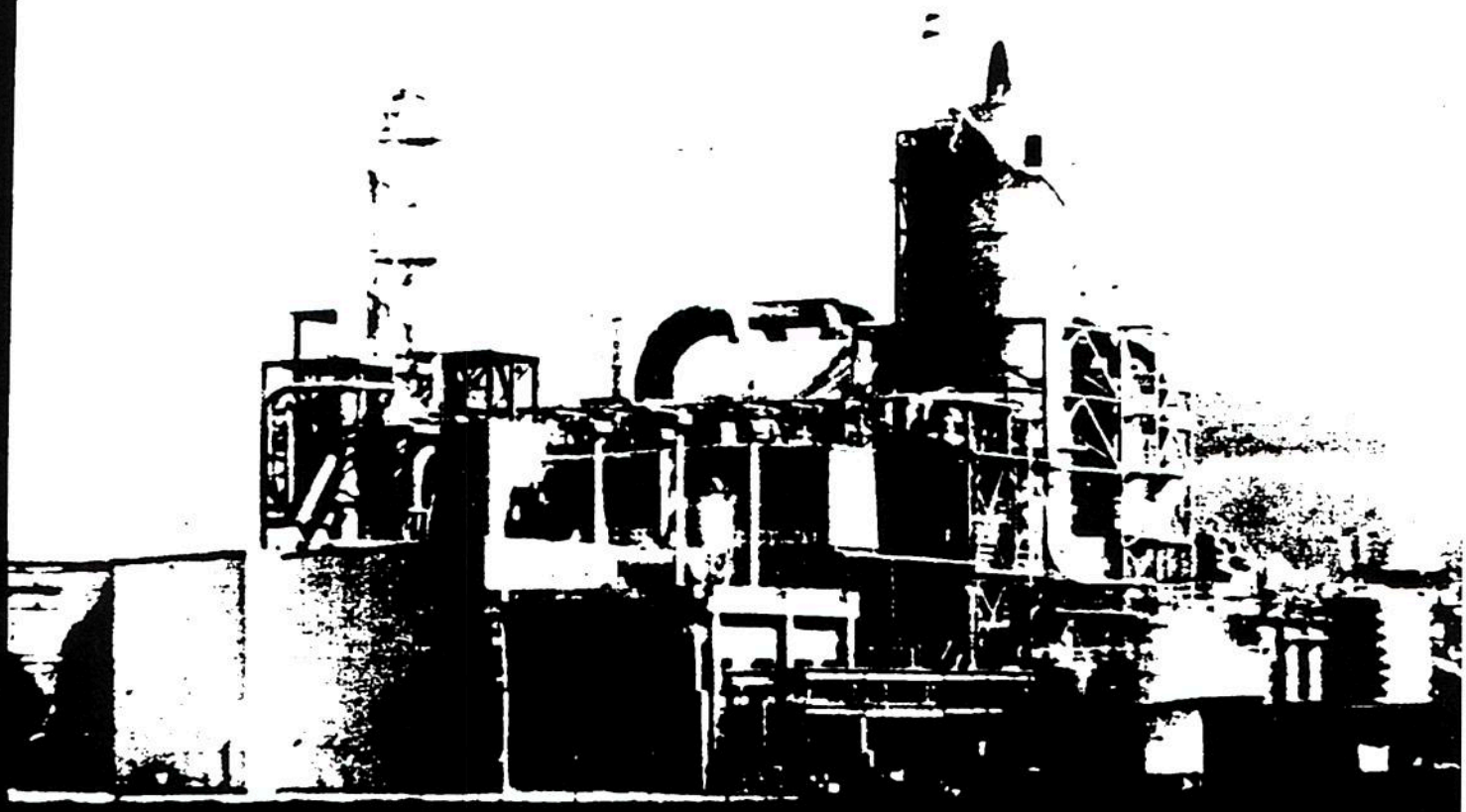
Ron Holley

Ronald E. Holley, P.E.
Project Manager

REH/kb

THE HYDROGEOLOGY OF THE COASTAL PLAIN STRATA OF RICHMOND AND NORTHERN BURKE COUNTIES, GEORGIA

Lee L. Gorday



GEORGIA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION
GEORGIA GEOLOGIC SURVEY

Information Circular 61

THE HYDROGEOLOGY OF THE COASTAL PLAIN STRATA OF RICHMOND AND NORTHERN BURKE COUNTIES, GEORGIA

Lee L. Gorday

GEORGIA DEPARTMENT OF NATURAL RESOURCES
J. Leonard Ledbetter, Commissioner

ENVIRONMENTAL PROTECTION DIVISION
Harold F. Reheis, Assistant Director

GEORGIA GEOLOGIC SURVEY
William H. McLemore, State Geologist

ATLANTA

1985

Information Circular 61

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THE HYDROGEOLOGY OF THE COASTAL PLAIN STRATA OF RICHMOND AND NORTHERN BURKE COUNTIES, GEORGIA

Lee L. Gorday

ABSTRACT

Rapid industrialization and urbanization in Richmond and northern Burke Counties, along with growth in the use of ground water for irrigation, have resulted in increasing withdrawals from ground-water sources. Ground-water use in the study area in 1980 was approximately 26.5 Mgal/day, most of which was pumped from the basal Cretaceous aquifer, the lowermost of two aquifers within the Cretaceous Gaillard formation. The upper Cretaceous aquifer is not extensively developed. Likewise, the shallower water-bearing units, including portions of the Huber Formation, the Lisbon Formation, the Barnwell Group, and the Altamaha Formation, are not extensively developed. Well information was adequate to define the hydrogeology of the basal Cretaceous aquifer; however, an evaluation of the hydrogeology of shallower units was not possible due to inadequate well information.

Both the basal and upper Cretaceous aquifers dip to the southeast. The aquifers are separated by a red clay or sandy clay that acts as a confining bed and is inferred to be a weathered surface within the Gaillard formation. Well logs indicate that this confining bed ranges in thickness from 7 to 60 feet thick. Aquifer test analyses indicate that this confining bed is leaky, with vertical hydraulic conductivities ranging from about 9.3×10^{-8} ft/s to 1.6×10^{-6} ft/s. The upper Cretaceous aquifer also is capped by a confining bed that is considered to be a weathered surface. Transmissivities of the basal Cretaceous aquifer range from about 2.6×10^{-2} ft^2/s to 2.0×10^{-1} ft^2/s.

Potentiometric data indicate that regional ground-water flow in the basal Cretaceous aquifer is generally from west to east. Natural discharge is into the Savannah River as well as into creeks and streams where the aquifer sediments are close to or at land surface. Recharge to the aquifer occurs as direct infiltration in the outcrop area and as leakage through overlying units. Pumping in eastern Richmond County has modified the natural flow system of the basal Cretaceous aquifer. A cone of depression exists immediately west of Bush Field as a result of large-scale industrial and municipal pumping. The potentiometric data also indicate that the basal Cretaceous aquifer is heavily stressed in the eastern industrial complex. As a result, additional ground-water withdrawals might adversely affect overall ground-water availability in this area. Ground-water availability in other parts of the study area is good, particularly in southern Richmond and northern Burke Counties. Yields from the basal Cretaceous aquifer are lower in the northwestern portion of the study area than in other parts of the study area due to the aquifer sediments being thin and shallow. The upper Cretaceous aquifer as well as the permeable portion of the Huber Formation is capable of supporting additional development of the ground-water resource.

Water in the basal Cretaceous aquifer is low in total dissolved solids and is slightly acidic. In some locations, the concentration of iron and manganese exceeds the EPA recommended limit. However, such concentrations do not pose a health risk, but may lead to the staining of fixtures and clothing.

INTRODUCTION

PURPOSE

The Augusta-Richmond County area has experienced rapid growth in both population and industrial capacity in recent years. This growth is expected to continue in the future and will probably include the northern part of Burke County. As such, the demand for water has grown and will continue to grow. Because much of this growth is anticipated to occur in areas where surface-water supplies are not readily available or practical to develop, the ground-water system will supply much of the additional demand.

Preliminary studies have suggested that increases in ground-water withdrawals might create local problems with both ground-water availability and ground-water quality. Therefore, future development should be planned such that any adverse impacts on both the quantity and quality of available ground water will be minimized. In order to adequately plan for this development, the hydrogeology of the area must be understood. This study was planned and executed to satisfy this need. Specific objectives were to:

1. Define and characterize the hydrogeologic units in the study area.
2. Define the geometry of the aquifer systems.
3. Evaluate the direction and rate of ground-water flow.
4. Identify the nature of recharge to the aquifer.
5. Evaluate the effects of aquifer inhomogeneity on hydrogeology.
6. Estimate water use.
7. Evaluate, if possible, how the aquifers in the area are hydrogeologically connected to each other and to rivers and streams.
8. Evaluate ground-water quality.
9. Evaluate general ground-water availability.

SCOPE

The records of more than 100 wells were compiled for this study from a number of sources. Aquifer tests were compiled and, where possible, the data were analyzed. No wells were drilled for this study. Some data deficiencies such as a lack of wells in certain areas, incomplete records on existing wells, and a lack of geophysical and drillers' logs limited the completion of the defined objectives. Nevertheless, for the basal Cretaceous aquifer, which is the most intensively used aquifer in the study area, the objectives of the study were fulfilled.

DESCRIPTION OF THE STUDY AREA

The area of this study is bounded on the northwest by the Fall Line, on the northeast by the Savannah River, on the southwest by Brier Creek, and on the southeast by Brigham's Landing Road (Fig. 1). Brigham's Landing Road is an arbitrarily chosen boundary, and has no hydrogeological significance. Geologically, the Fall Line is considered to be the surface exposure of the contact between the Coastal Plain sediments and the crystalline rocks of the Piedmont (Clark and Zisa, 1976). The Fall Line is a hydrogeologic boundary by virtue of the contrast in permeabilities of the crystalline rocks of the Piedmont relative to the unconsolidated sands and gravels of this area of the Coastal Plain. Both Brier Creek and the Savannah River act as hydrologic sinks. Because Brier Creek is smaller than the Savannah River, it has less effect on the ground-water flow.

The study area lies within the Fall Line Hills and Vidalia Upland Districts of the Coastal Plain Physiographic Province (Clark and Zisa, 1976). The Fall Line Hills District is highly dissected. Slopes are steep except in the floodplains of rivers. Most of Richmond County is within this district. The southern edge of Richmond County and almost all of Burke County are within the Vidalia Upland District. The topography of this area is characterized by moderate dissection and relatively narrow floodplains (Clark and Zisa, 1976).

Major streams in the study area include Brier Creek, McBean Creek, Spirit Creek, and Butler Creek. Brier Creek, which forms the southwestern boundary of the study area, flows into the Savannah River approximately 25 miles southwest of the study area. The other major streams join the Savannah within the study area.

Augusta is the only large city in the study area. In 1980, the population of Augusta was 47,532; however, there are many more people living in adjacent unincorporated areas. The total population of Richmond County in 1980 was 181,629 (U.S. Bureau of the Census, 1982). Census figures for Richmond County from 1930 to 1980 (Fig. 2) show the population growth in this area.

Industries are concentrated in Richmond County along the Savannah River and paralleling highways and rail lines. These industries manufacture a wide range of products including textiles, paper products, lumber, fertilizer, structural bricks, refractory ceramics, and a number of chemicals used in agriculture, textiles, and paper processing. Many of these industries use large quantities of water in their manufacturing process. Future industrial development appears likely due to the availability of large tracts of land, the abundant labor force, good transportation facilities (rail, air, road and river) and an abundant water supply. As a result, there is a potential for increased demand for ground water and a corresponding increase in the potential for ground-water contamination.

In the southern part of the study area, agriculture is the primary land use. Although the topography of the area is not conducive to the very large scale irrigation equipment that is popular in other areas where fields are large and flat, new equipment specifically designed for smaller, irregularly shaped fields is being developed. As a result, water use for irrigation is expected to increase.

The climate of the study area is characterized by warm, humid summers and mild winters. Monthly mean high temperatures at Bush Field, southeast of Augusta, range from 91°F in July to 58°F in December and January. Monthly mean low temperatures range from 39°F in December and January to 72°F in July (Michael Baker, Jr., Inc., 1979, p. 27).

Although climatological data indicate that the study area is within a relatively dry part of the state, precipitation is still plentiful. Mean annual precipitation at Bush Field is approximately 44.6

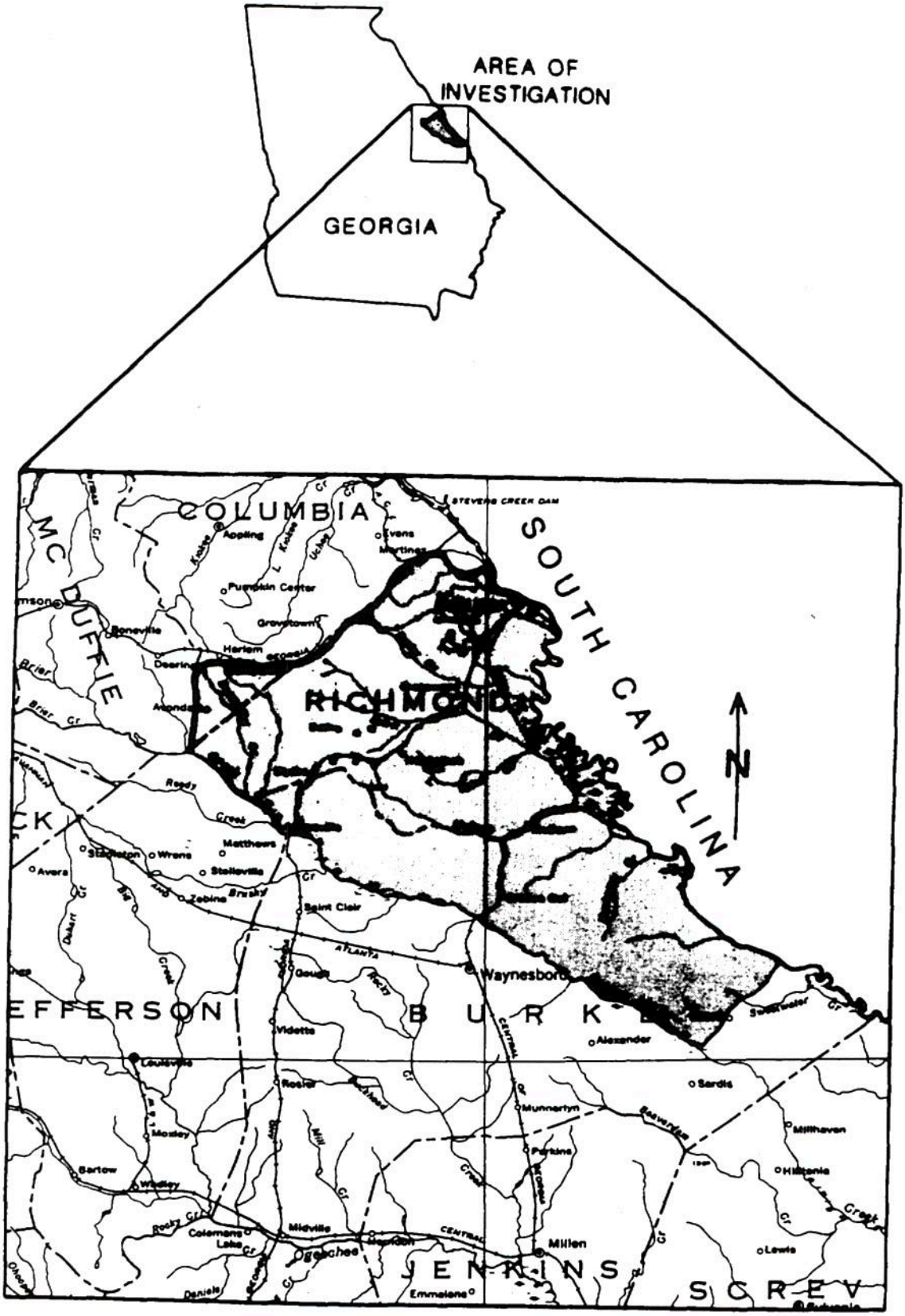

Figure 1. Location of the study area.

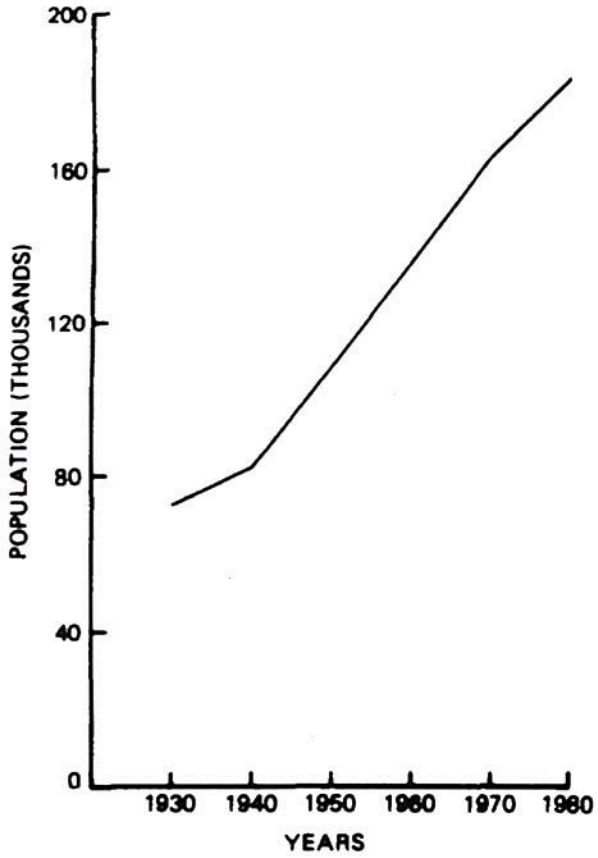

Figure 2. Population of Richmond County from 1930 to 1980. Data from the U.S. Bureau of the Census (1982).

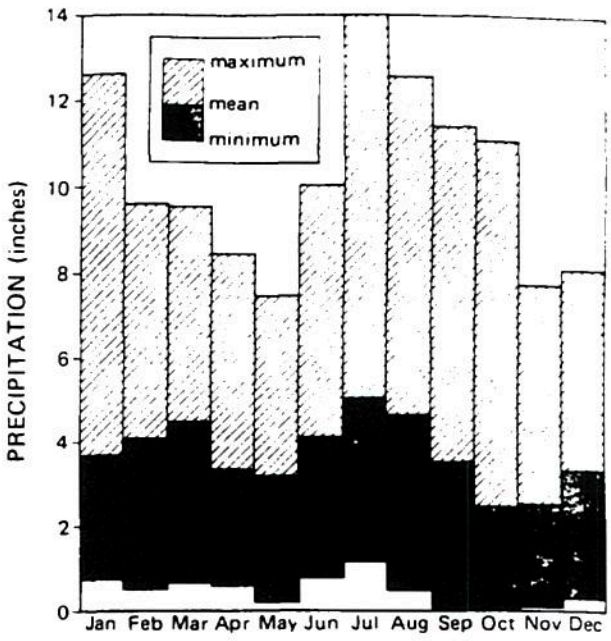

Figure 3. Mean and extreme monthly precipitation at Bush Field, Augusta. Data from Michael Baker, Jr., Inc. (1979).

inches per year based on 89 years of records (Michael Baker, Jr., Inc., 1979, pg. 27). Figure 3 indicates that precipitation is greatest in July and August, a period which coincides with peak thunderstorm activity. Precipitation is lowest in October and November. Although as much as 14 inches of snowfall have been recorded, snowfall is not a significant part of the total precipitation, and averages less than an inch per year.

PREVIOUS INVESTIGATIONS

A number of geologic and hydrogeologic investigations have been conducted in areas that include or adjoin the area of this study. Most of these studies were regional in scope. In 1898, McCallie reported on the artesian wells in south Georgia, including Richmond and Burke Counties. Ladd (1898) inventoried the clays of Georgia. Sloan (1904, 1907) reported on the geology and clay deposits of South Carolina. Veatch (1909) investigated the clay deposits of Georgia. Later, Veatch and Stephenson (1911) made a preliminary report of the geology of Georgia's Coastal Plain. Cooke studied the Coastal Plain of South Carolina (1936) and Georgia (1943). LaMoreaux (1946a, 1946b) studied the geology and hydrogeology of east-central Georgia. Eargle (1955) mapped the Cretaceous rocks and reported on their stratigraphy. LeGrand and Furcron (1956) reported on the geology and hydrogeology of central-east Georgia, including the area of this investigation. Hurst and others (1966) inventoried the mineral resources of the central Savannah River area. Prowell and others (1975) documented the Belair Fault in western Richmond County. Huddlestun and Hetrick (1978, 1979) revised the stratigraphy of the updip Jacksonian sediments. Faye and Prowell (1982) examined the hydrology of eastern Georgia and western South Carolina for the effects of possible faulting. Vincent (1982) reported on the hydrogeology of the Jacksonian-age aquifer in eastern Georgia.

WELL NUMBERING SYSTEM

Wells used in the preparation of this report were assigned arbitrary numbers. Plate 1 indicates the locations of the wells referred to in this report. Appendix A lists these wells in numerical order along with the owner's name, the owner's well number for the well, latitude, longitude, and the type of data available. The locations of wells that were still in existence were field checked. A number of wells (and core holes) were plugged or otherwise abandoned.

ACKNOWLEDGEMENTS

I would like to express my appreciation to the many individuals representing industries, municipalities, and other government agencies, as well as private citizens who have enabled me to conduct this study by supplying information and allowing access to their wells. Without their cooperation, this study would not have been possible.

I would like to thank Donald Hudson of Proctor and Gamble and William Martin of Virginia Supply and Well Co. for their cooperation in allowing me to collect data during the testing of the Proctor and Gamble well. I thank Harry Blanchard of the U.S. Geological Survey for providing equipment for the Proctor and Gamble aquifer test as well as information on the location and access to wells in the study area. Robert E. Faye of the U.S. Geological Survey provided unpublished data that otherwise would have been unobtainable, in addition to discussions on the framework and character of the aquifer. His review of the manuscript in various stages resulted in a much improved document. Mr. Faye's input is greatly appreciated. Without the help of all of these people, this study would have been much more difficult to complete.

STRATIGRAPHY

GENERAL

Figure 4 is a stratigraphic column of Coastal Plain units within the study area, and is modified from Huddlestun's (1981) correlation chart of Coastal Plain sediments. A brief description of each unit is included below. Some of the units included here are currently informal with respect to the North American Stratigraphic Code (North American Commission on Stratigraphic Nomenclature, 1983). Capitalized rank designations indicate formal units, for example: Barnwell Group, Huber Formation, and Irwinton Sand Member. Uncapitalized rank designations indicate informal units, for example: Oconee group, and Gaillard formation.

"BASEMENT" COMPLEX

The "basement" complex in the study area is a subsurface extension of the crystalline rocks of the Piedmont Province. These rocks are very complex metavolcanics which locally have been intruded by granite. Rock types noted include gneisses and schists of varying mineralogy, granite, phyllite and slate. Detailed studies of these rocks have been conducted, but are not pertinent to this investigation. Useful references relative to the "basement" complex include Snoke (1978) and Bramlett and others (1982).

UNDIFFERENTIATED TRIASSIC-JURASSIC ROCKS

Red to greyish-brown siltstones, sandstones and breccias underlie the Coastal Plain strata in the southern part of the study area. Faye and Prowell (1982, p. 11) note that these rocks are probably of Triassic to Early Jurassic age. Marine and Siple (1974) present evidence to indicate that these rocks are fanglomerates that fill an elongate basin that runs southwest from South Carolina into Georgia. Marine and Siple (1974) named the basin after the former town of Dunbarton, now a part of the Savannah River Plant. They suggest that the Dunbarton Basin is correlative with the Newark Supergroup, and postulate that the Dunbarton Basin formed due to normal faulting of the crystalline rocks that are exposed north of the Fall Line.

COASTAL PLAIN SEDIMENTS

Oconee Group

In the area of study, the Oconee group includes the Huber Formation and Gaillard formation. The Oconee group as used in this report is roughly equivalent to the "Tuscaloosa Formation" as used by a number of authors, including Cooke (1936), LeGrand and Furcron (1956), and Siple (1967). The formal definition of the Oconee group is in review by Huddlestun. Although the Huber and Gaillard are of different ages, they are similar lithologically. The Oconee group typically contains cross-bedded sands and gravels interbedded with sandy clays. The sand and gravel is commonly comprised of quartz with lesser quantities of feldspar. The sands and gravels contain some clay. Large flakes of mica are common.

The kaolin that is mined at a number of locations near the Fall Line in Georgia and South Carolina is from the Oconee group. These commercial-grade kaolin deposits, however, are not representative of the clays of the Oconee group as a whole in that Oconee group clays are typically sandy.

Gaillard Formation. The lower part of the Oconee group in the study area is the Gaillard formation. A formal proposal for the term Gaillard formation is in preparation by Huddlestun and Chowns. The proposed type locality is the pit of the Atlanta Sand and Gravel Company near the town of Gaillard in Crawford County. In the northern part of the study area the Gaillard overlies the crystalline rocks of the Piedmont. In the southern part of the study area it overlies the undifferentiated Triassic rocks. It, in turn, is overlain by the Huber Formation. The Gaillard formation-Huber Formation contact marks the Cretaceous-Tertiary unconformity. A minor unconformity is inferred to exist within the Gaillard formation. An oxidized zone noted on many drillers'

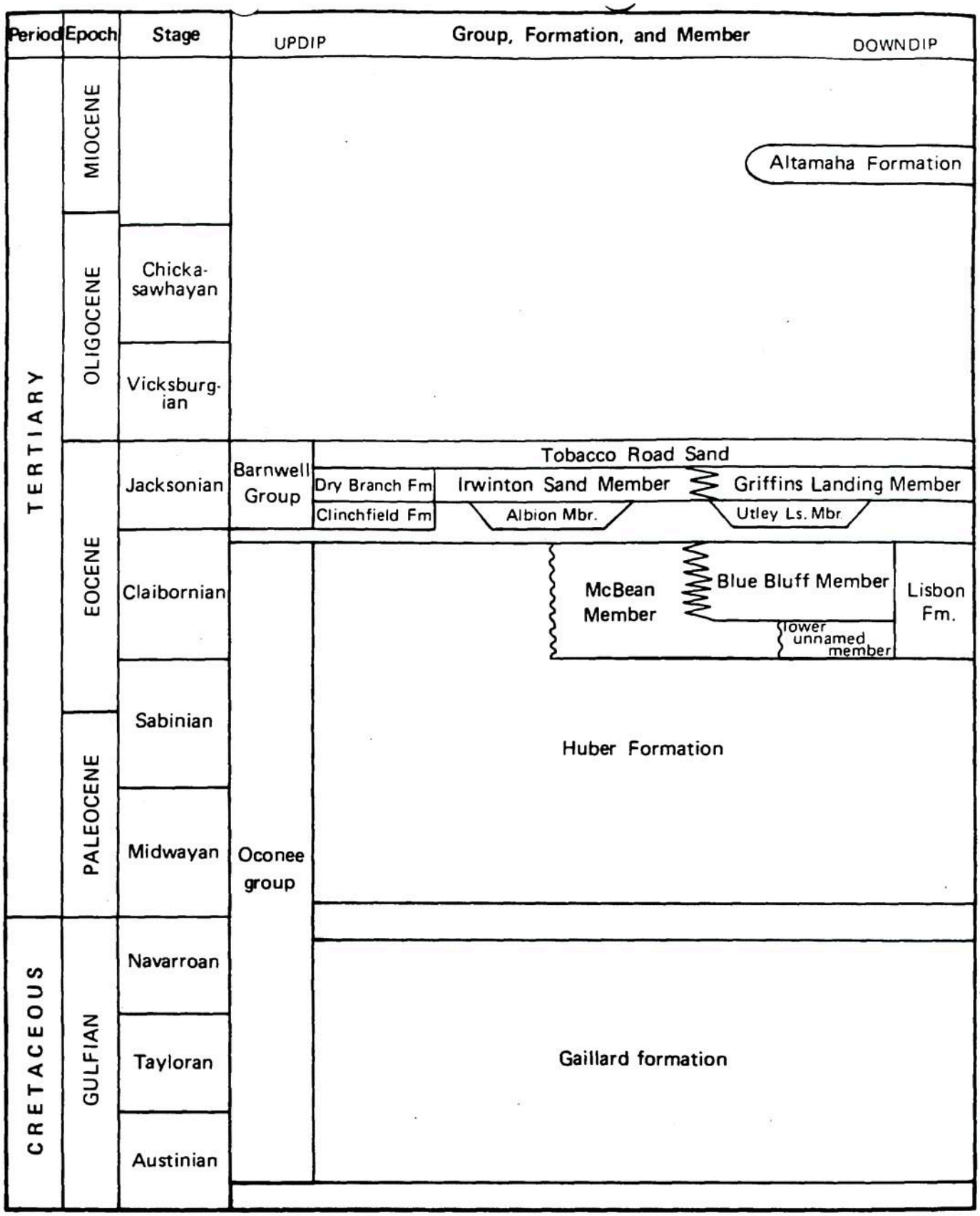

Figure 4. Stratigraphic column of Coastal Plain sediments in Richmond and northern Burke Counties. Modified from Huddlestun (1981). Shaded areas indicate time not represented by sediments.

logs as a red clay or sandy clay marks both the unconformity at the top of the Gaillard and the inferred unconformity within the unit. In some locations, the oxidized zone is not present due to erosion prior to the deposition of the overlying sediments. The Tertiary-Cretaceous contact is exposed at a cut on the south side of Dixon Airline Road approximately 0.4 mile east of Highway 56 (4000 feet west-northwest of well 77). At this exposure, the red clay is approximately 20-feet thick at both ends; however, it pinches out and is absent in the middle of the exposure. Figure 5 is a photograph of the eastern side of this exposure. The clay is a moderate-red color in outcrop and contains moderate quantities of silt and small quantities of sand. Because of weathering of the exposure, bedding is indistinct. At locations where the upper oxidized zone is missing, the contact between the Gaillard formation and the Huber Formation is difficult to distinguish due to the similar lithologies of the two units.

The Gaillard formation is composed of alternating beds of clay, sand, and gravel. The sandy parts of the formation are poorly sorted and contain very coarse to fine sand with gravel, interspersed clay, and flakes of muscovite mica. Quartz and feldspar are the dominant sand components. The sands and gravels of the Gaillard formation are typically crossbedded. Figure 6 is a photograph of a typical exposure of the sand and gravel of the Gaillard formation at the exposure noted above. Kaolinite is the dominant clay mineral in the Gaillard formation. Clay beds within the unit range from very pure, commercial-grade kaolin, to sandy and silty micaceous clays. The environment of deposition of the Gaillard formation is thought to be fluvial (Siple 1967, p. 26-28) based upon the lack of marine fossils, the poor sorting of the sands and gravels, the irregular thickness of individual beds, the sedimentary structures (particularly crossbedding) and the presence of gradational changes from clay to sand in short distances within an individual bed. A late Cretaceous age for the Gaillard formation is now generally accepted. A more specific age for the unit has not been satisfactorily established due to the sparseness of fossils and the resulting lack of paleontological study. The inferred weathered zone within the formation suggests that the unit was deposited during at least two intervals of time.

Faye and Prowell (1982, p. 12-15) refer to the Gaillard formation of this report as the Middendorf and "Black Creek(?)" formations. They state that "a zone of oxidation and weathering marks the Middendorf-Black Creek Contact" (p. 15). This zone of weathering is believed to be the same as the weathered surface previously noted within the Gaillard formation. Therefore, the lower part of the Gaillard is probably equivalent to their Middendorf, whereas the upper part is probably equivalent to their "Black Creek(?)" formation.

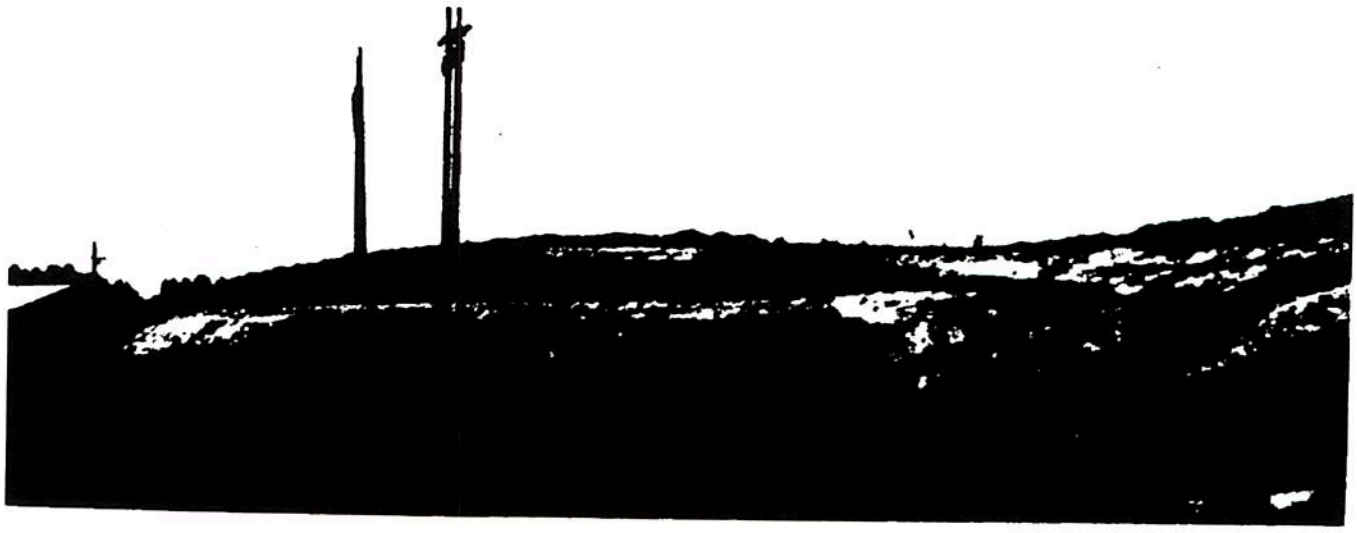

Figure 5. Photograph of the Tertiary-Cretaceous contact exposed along Dixon Airline Road, Richmond County. Note the weathered zone at the top of the Cretaceous pinching out to the right.

by Huddlestun (in review) as part of the Hawthorne Group. The type locality is at Upper Sister Bluff on the Altamaha River in Appling County. The Altamaha Formation occurs on hill tops in the southern part of the study area and is a sandy clay lacking primary sedimentary structures. In outcrop the unit is mottled due to weathering. Huddlestun (in review) suggests an early Miocene age for the Altamaha in Screven and Burke Counties whereas in the type area the age is thought to be middle Miocene.

Alluvium

Alluvium deposits in the study area occur along the Savannah River and along major creeks. The alluvial sediments range in size from sand and gravel to clay and sandy clay. Sedimentation patterns are complex. Clay beds within the alluvium commonly pinch out. The deeper sediments are generally coarser and more uniform. The base of the alluvium is difficult to distinguish where it overlies the Gaillard formation due to the similar lithologies. The lack of a weathered surface at the top of the Gaillard formation compounds the problem in many areas. In the logs of wells 71 and 106 (see Appendix B), the contact is inferred to exist where the color of the sediments changes from brown to white.

STRUCTURE

REGIONAL DIP

The geologic units of interest in this study dip and thicken to the southeast, creating a wedge of sediments. Figure 7 shows a cross-sectional view of the study area running from north-northwest to south-southeast. This cross section is simplified in that the formations are not subdivided, and control points are widely spaced. The location of the undifferentiated Triassic deposits in Figure 7 is based on information from Marine and Siple (1974) and Faye and Prowell (1982).

The base of the Gaillard formation dips to the south-southeast at approximately 38 ft/mi. This rate agrees with the values given by LeGrand and Furcron (1956, p. 12) and by Siple (167, p. 19). The rate of dip is not constant, as indicated in Figure 7. The dip at the top of the Gaillard formation (the top of the Cretaceous) is approximately 23 ft/mi. The Gaillard thickens rapidly to the south-southeast. At well 119, the Gaillard formation is approximately 427-feet thick. The apparent dip at the top of the Huber Formation is approximately 16 ft/mi. between well 118 and well 92. Because these wells are nearly perpendicular to the regional strike, the true dip should not be significantly different. The maximum thickness of the Huber Formation in the study area, based on drillers' logs, is 155 feet at well 92.

The apparent dip at the top of the Lisbon Formation between well 118 and well 92 is about 10 ft/mi. The thickness of the Lisbon ranges from 174 feet at well 92 to 61 feet at well 118. The Lisbon Formation is absent at outcrops along Bennock Mill Road, approximately 2 miles north of well 118, indicating that the Lisbon either pinches out or grades into the Huber Formation.

FAULTING

The Belair Fault zone runs from northeast to southwest along the northwestern edge of the study area (see Plate 1). It was first noticed in a clay pit wall by O'Connor (O'Connor and Prowell, 1976) and has subsequently been traced by mapping, drilling and trenching. The fault zone is comprised of a series of en echelon, reverse faults in which the southeastern block has moved upward relative to the northwestern block. Movement of up to 100 feet on the top of the basement has been noted in the northern part of the fault zone (O'Connor and Prowell, 1976, p. 24). However, at the southern end of the fault zone, vertical separation on this horizon was only 15 feet, which O'Connor and Prowell considered to be the limit of resolution due to relief on the unconformity.

Faye and Prowell (1982) reported data suggestive of faulting in the southern part of the area of this study. They proposed the existence of two faults that displace at least the base of the Cretaceous, and estimated their locations. The Millet Fault was postulated to exist along a northeast-southwest trend that falls along Brigham's Landing Road, the southeastern margin of the area for this study. The second postulated fault, the Statesboro Fault, parallels the Millet Fault and lies to the southeast of the study area. The Georgia Power Company, builders of Plant Vogtle, a nuclear-powered generating facility, retained the Bechtel Corporation to assess whether the postulated faults exist. Based on the results of a number of test borings across the trace of the postulated fault, on seismic profiling and on other methods of investigation, the Bechtel report concluded that there was no capable fault in the vicinity of the postulated Millet Fault (Bechtel Corp., 1982, p. iii).

HYDROGEOLOGIC UNITS

INTRODUCTION

The boundaries of geologic and hydrogeologic units often do not coincide, which is the case in Richmond and northern Burke Counties. For example, the Gaillard formation contains two permeable zones and two confining zones that are laterally extensive within the study area. Neverthe-

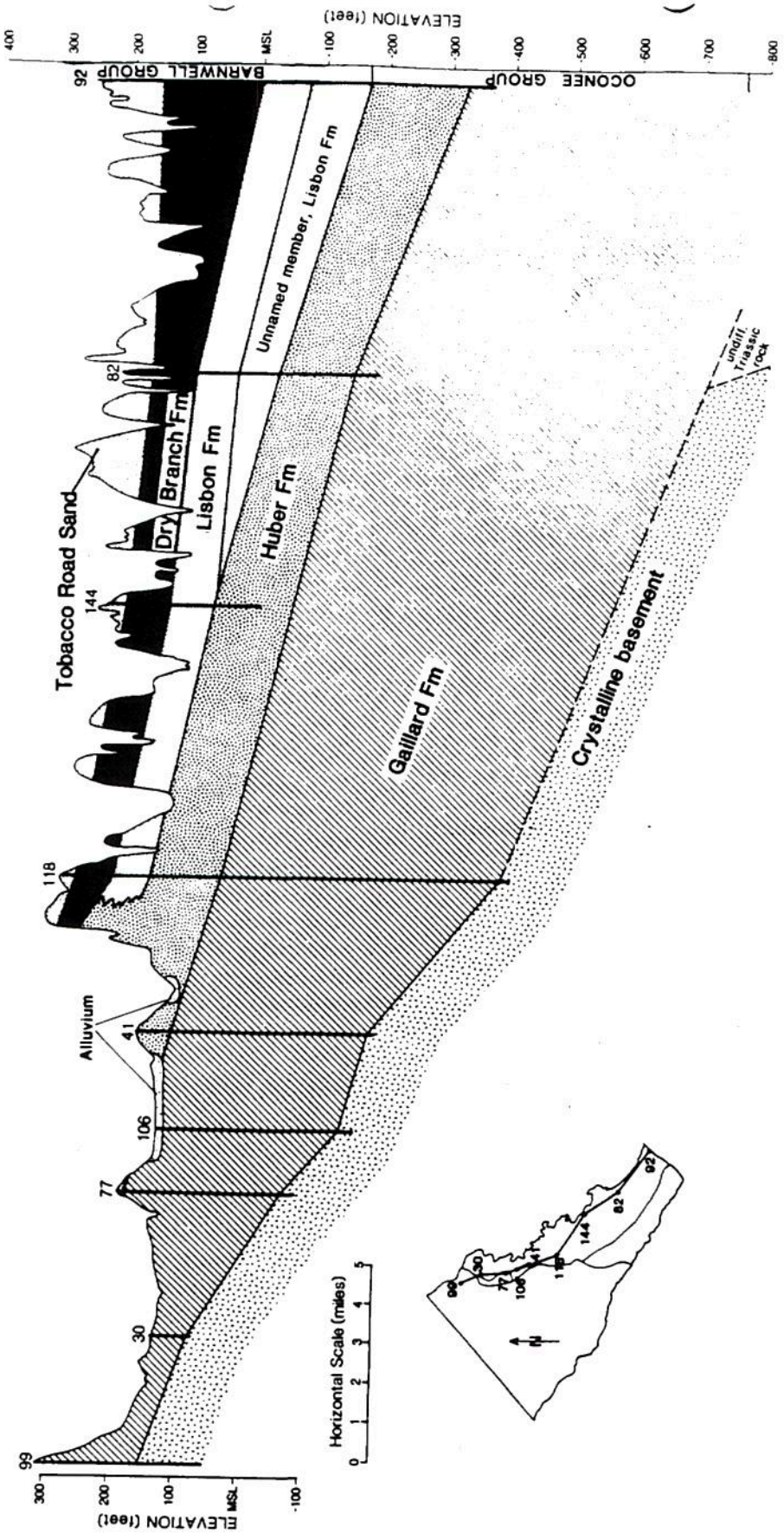

Figure 7. Geologic cross section. Location of Triassic rock based on Marine and Siple (1974) and Faye and Prowell (1982).

less, the aquifers within Coastal Plain sediments are discussed in the context of the geologic units for ease of understanding.

GAILLARD FORMATION

Introduction

Previous investigators have considered the Cretaceous sediments to contain a single aquifer (often including the Huber Formation within the Cretaceous). On a regional scale, considering the Cretaceous to be a single aquifer may not result in any problems. However, at the scale of this investigation it is impossible to understand the hydrogeology of the area without recognizing that two distinct flow systems exist within the Gaillard formation. As will be discussed later, the confining bed separating the basal Cretaceous aquifer from the upper Cretaceous aquifer appears to be less distinct in the western part of the study area than in the east. Therefore, the use of these hydrogeologic units beyond the limits of this study may not be appropriate.

Basal Cretaceous Aquifer

Sediments of the Upper Cretaceous Gaillard formation contain two aquifers. These two aquifers are the primary source for ground water in the study area. The lower aquifer within the Gaillard formation is herein called the basal Cretaceous aquifer. In most locations where the aquifer is utilized, the base of the aquifer is the top of the saprolite overlying the crystalline "basement." Several well logs (wells 41, 102, and 118 for example) indicate that at some locations, the aquifer lies directly on unweathered rock, suggesting that the saprolite was eroded prior to the deposition of the aquifer, that it never formed, or that it was present but not detected by the person making the log. In several locations, well 106 for example, a clay bed that may be of Cretaceous age underlies the aquifer. Farther downdip in Burke County, the basal Cretaceous aquifer overlies the Triassic "basement," although few wells are deep enough to encounter the Triassic due to the availability of water from the upper Cretaceous aquifer and the high costs associated with deep drilling.

The basal Cretaceous aquifer is confined at the top by a red clay or sandy clay. This clay is interpreted to be a weathered surface that developed during a pause in the deposition of the Gaillard formation due to its red color, and the wide range of thicknesses known for this bed even within a small area. Faye and Prowell (1982, Fig. 3) report this clay at the top of their unit UK_2. They also report a slightly younger age for the overlying unit UK_3. Faye and Prowell's findings support the interpretation that the red clay is a weathered surface.

Upper Cretaceous Aquifer

The top of the red clay bed noted in the previous section marks the base of the second and upper aquifer within the Gaillard formation, herein called the upper Cretaceous aquifer. This aquifer is confined at the top by the red clay located at the top of the Gaillard formation. This red clay, like the red clay that separates the two aquifers, is interpreted to be a weathered surface. The upper clay is generally thicker than the clay between the aquifers; however, the thicknesses of both clay beds vary widely, probably due to erosion just prior to the deposition of the overlying unit.

Within both the basal and upper Cretaceous aquifers, other clay beds have been noted, particularly in downdip areas. The presence of these clay beds illustrates the fact that many permeable zones of varying interconnection could be delineated within the Gaillard formation, given enough detailed information. The two Cretaceous aquifers delineated in this report are probably interconnected to some degree; however, they are individually traceable throughout the study area.

HUBER FORMATION

Sediments of the Huber Formation are only tapped by wells in the southern part of the study area due to the limited thickness of permeable sediments in updip areas and the availability of water from the Cretaceous aquifers. The Huber's thick beds of clay and sandy clay reduce the permeable thickness of the formation significantly. The basal portion of the formation, however, would produce a moderate yield. Within the study area, the Huber is rarely used for wells of high capacity.

LISBON FORMATION

The fine- to medium-grained, moderately to well-sorted sands of the unnamed lower member of the Lisbon Formation are sufficiently permeable to supply water for domestic wells. Within the study area, the permeable thickness of the unnamed lower member is generally less than 50 feet, limiting the usefulness for larger capacity wells. The Blue Bluff member would not be expected to yield significant quantities of water. The McBean member could provide small to moderate quantities of water.

BARNWELL GROUP

The hydrogeologic character of the Barnwell Group is quite variable within the study area. The tendency of the Clinchfield Formation to occur only in local areas precludes its use as a regional aquifer. In addition, the Albion Member of the Clinchfield is not sufficiently permeable to be considered an

aquifer. The Twiggs Clay and Griffins Landing Members of the Dry Branch Formation are relatively impermeable when compared to the well-sorted sands of the Irwinton Sand Member. The Irwinton Sand Member is sufficiently permeable to supply water for domestic use. The Tobacco Road Sand is relatively permeable; however, its saturated thickness is small compared to deeper aquifers. Therefore, use of the Tobacco Road Sand as a water-bearing unit is limited to domestic use within the study area.

ALTAMAHA FORMATION

Because the Altamaha Formation consists of sandy clays, the unit has a low hydraulic conductivity. Within the study area, sediments of the Altamaha Formation cannot supply large quantities of water. Although there are no high capacity wells tapping the unit, there are shallow, dug or bored wells that are limited to the tops of hills where the unit occurs. These types of wells can be developed in the Altamaha because of their large diameter and high storage capacity.

ALLUVIUM

The lower part of the Savannah River alluvium is highly permeable and in the northernmost part of the study area is hydraulically connected to the basal Cretaceous aquifer. In the vicinity of the Olin plant (wells 42 and 71) and the Bush Field well field (wells 101-106), drillers' logs indicate that the alluvium is at least indirectly connected to the upper Cretaceous aquifer. The alluvium contains a number of permeable zones separated by clay-rich beds. The degree of interconnection of the permeable zones has not been established. No production wells directly tap the alluvium.

AQUIFER GEOMETRY

Plate 2 is a cross section running approximately perpendicular to dip through the area of greatest well concentration. Although the cross section was constructed primarily using drillers' logs, geophysical logs were used to help clarify ambiguities. The cross section indicates that both the basal and upper Cretaceous aquifers dip gently to the southeast. Appendix B contains the drillers' logs used to construct Plate 2.

Figure 8 is a structure-contour map showing the altitude at the base of the basal Cretaceous aquifer. The base of the aquifer shows some relief, as indicated by the bending of the 0, -150 and -400 foot contours. Considering that the base of the basal Cretaceous aquifer is probably an old erosional surface, it is likely that there is more relief on this surface than is depicted in Figure 8 due to the generalizing effect of the wide well spacing. The dip of the base of the aquifer increases between the Continental Forest well (41) and the Kimberly Clark wells (117-120). This is readily apparent on the cross section, and is also indicated in Figure 8 by the tighter spacing of the -200, -250, -300, -350, and -400 foot contours. For well 99, (indicated by an open circle on Figure 8), a reliable altitude at the base of the basal Cretaceous aquifer was not available; therefore, the top of the "basement" complex was assumed to be the base of the aquifer.

As noted earlier, the Belair Fault Zone is known to cut the base of the Cretaceous sediments in the northwestern part of the study area. (Prowell and others, 1975; O'Connor and Prowell, 1976; and Prowell and O'Connor, 1978). The structure-contour map in Figure 8 indicates a 17-foot difference in the elevation of the base of the basal Cretaceous aquifer at wells 112 and 113, core holes drilled as a part of the Belair fault study on opposite sides of the fault. The effects of the fault on the hydrologic units could not be evaluated due to the sparseness of well data in the area.

Figure 9 is a structure-contour map of the top of the basal Cretaceous aquifer. Like the base of the aquifer, the top dips to the southeast. Northwest of the Continental Forest well (41), the dip of the top of the aquifer is approximately 25 ft/mi. Southeast of the Continental Forest well, the dip increases to approximately 60 ft/mi. Another area where the top of the aquifer dips more steeply, approximately 65 ft/mi, is west of Hephzibah. These dips are unusually high for the study area.

Plate 2 illustrates that the thickness of the basal Cretaceous aquifer varies considerably. The aquifer thickens from 30 feet at well 51 at the Babcock and Wilcox plant, just south of Augusta, to 141 feet at well 71 at the Olin Corporation plant, south of Bush Field, a distance of 7 miles. South of the Olin plant, the thickness of the basal aquifer decreases at a rate of approximately 15 ft/mi, largely as a result of the increased dip of the top of the aquifer.

Figure 10 is an isopach map of the basal Cretaceous aquifer. Although well density is low west of the industrial complex, it appears that the axis of the thickest part of the aquifer trends from the Olin complex toward Hephzibah. The anomalously large aquifer thicknesses reported for wells 9 and 10 are not totally representative of the basal Cretaceous aquifer. Much of the Gaillard formation (including the clay beds that are used to define the limits of the aquifer) has been eroded by the

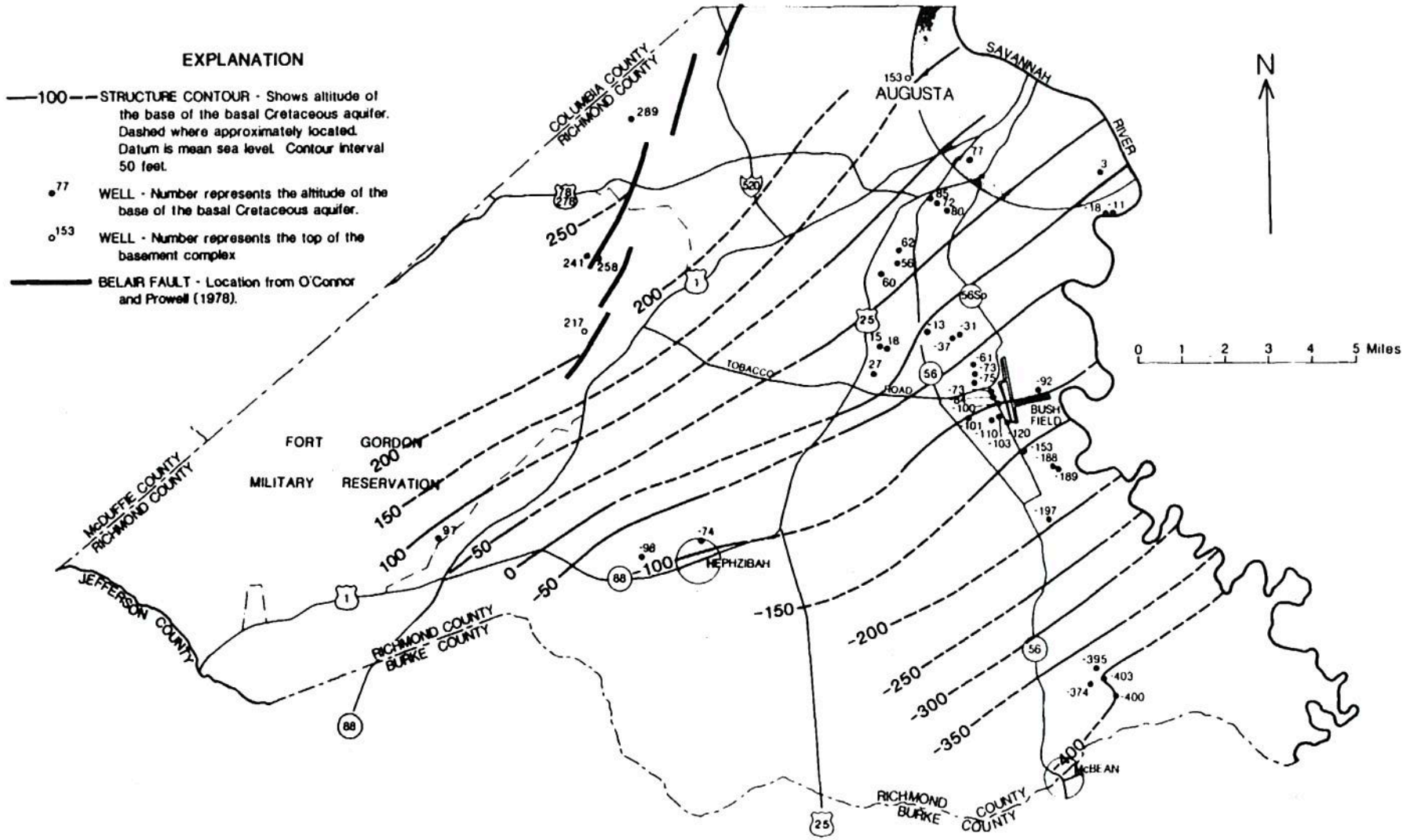

Figure 8. Structure-contour map of the base of the basal Cretaceous aquifer.

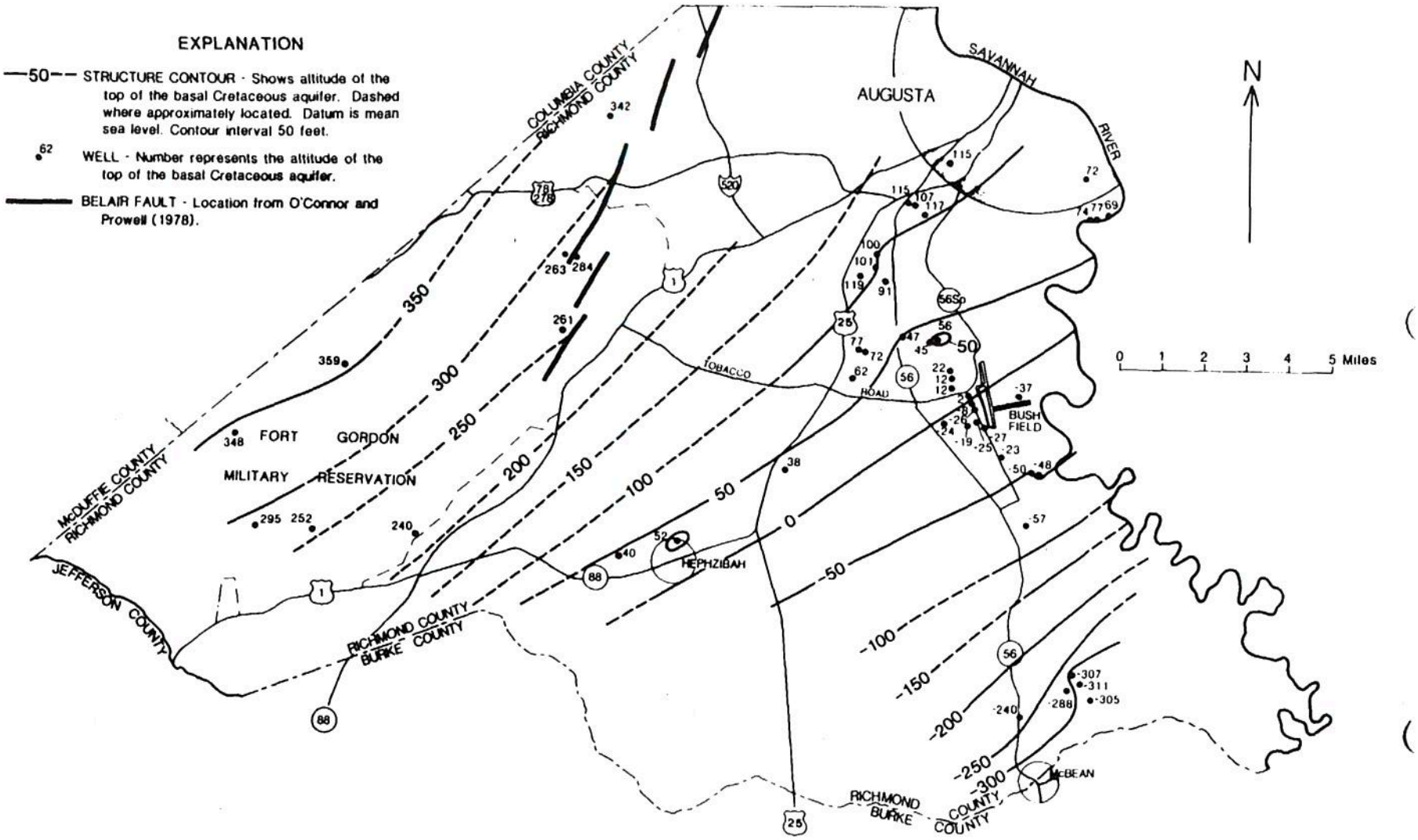

Figure 9. Structure-contour map of the top of the basal Cretaceous aquifer.

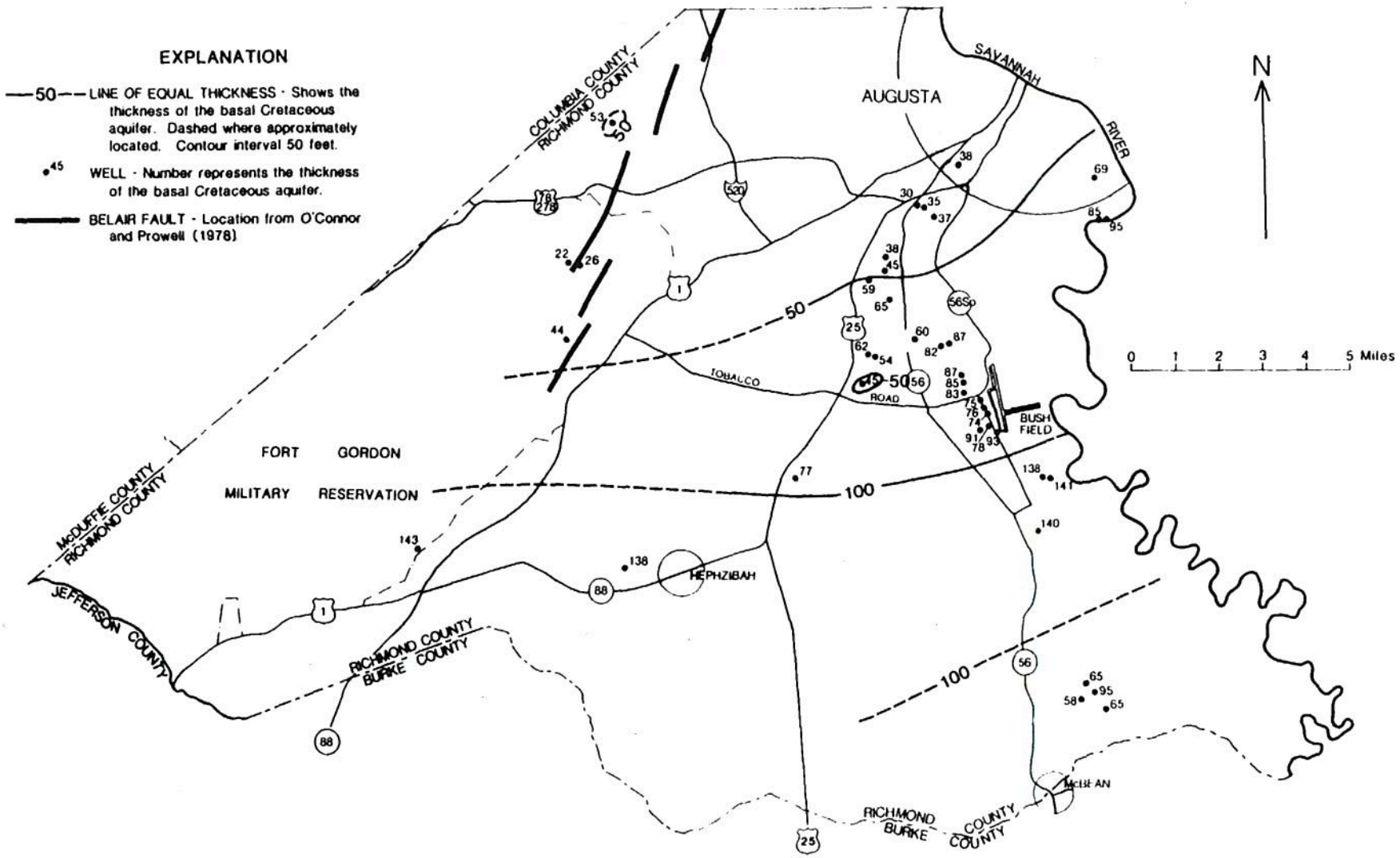

Figure 10. Isopach map of the basal Cretaceous aquifer.

Savannah River, which subsequently deposited alluvium above it. Thus, the aquifer in this location may be comprised of both Cretaceous and Recent sediments.

Well density is greatest in the eastern portion of Richmond County and decreases rapidly to both the west and south. The drillers' logs of many of the wells in western Richmond County indicate a permeable strata at the base of the well. Because it is unusual to cease drilling within a permeable strata, the author believes that in some of these wells, either the "basement" complex or a confining bed was encountered at the end of drilling, but was not noted on the driller's log.

The clay beds that separate the aquifers are of particular interest hydrologically in that they inhibit the vertical movement of water. The degree of hydraulic separation is dependent upon the vertical hydraulic conductivity and the thickness of the clay beds which vary widely, even over a short distance. The red clay that separates the basal and upper Cretaceous aquifers is less distinctive on the electric logs of wells in western Richmond County than on the electric logs of wells in the industrial district. For example, on the electric log of the Albion mine well (32), the red clay noted on the driller's log is one of several intervals of uniformly low resistivity in that part of the log, whereas the confining zone between the basal and upper Cretaceous aquifers is quite distinct on the electric logs of wells 41 and 102 (See Plate 2). This may indicate that the effectiveness of the confining bed between these aquifers diminishes to the west. If this is the case, it is possible that in the western part of Richmond County, the basal and upper Cretaceous aquifers are in closer hydraulic connection and may act as a single aquifer system. Nevertheless, for this report the basal and upper Cretaceous aquifers in western Richmond County are delineated as separate aquifers.

The known thickness of the clay bed between the Cretaceous aquifers ranges from 60 feet at well 39 to 7 feet at well 122. The thickness of the clay bed at the top of the Gaillard formation ranges from 110 feet at well 72 to 10 feet at well 77. Although there are no documented instances of the clay beds being absent in the subsurface, the wide range of thicknesses suggests that windows may occur in the clay beds.

Figure 11 is a structure-contour map of the base of the upper Cretaceous aquifer. The southeastward dip and the abrupt increase in the magnitude of dip south of the Continental Forest well (well 41) generally coincide with the dip patterns of the top and bottom of the basal Cretaceous aquifer.

Figure 12 depicts the altitude of the top of the upper Cretaceous aquifer. In the northeastern portion of the study area, elevations of the top of the upper Cretaceous aquifer do not correspond to the regional dip, suggesting that the top of the upper Cretaceous aquifer has been eroded. Like the basal aquifer at wells 9 and 10, the upper Cretaceous aquifer is in direct contact with permeable alluvial sediments in the area of Bush Field. Relief on the top of the upper Cretaceous aquifer is significant. This is particularly evident at the town of Hephzibah, where drillers' logs of wells 1200 feet apart indicate a difference of 57 feet in the elevation of the top of the upper aquifer, and north of McBean, where a 38-foot difference is indicated by the electric logs of wells 1700 feet apart.

Core logs (well numbers 112 and 113) indicate a 25-foot difference in the altitude at the bottom of the upper Cretaceous aquifer across the Belair fault. A difference of 24 feet is indicated on the top of the aquifer.

AQUIFER PARAMETERS

Transmissivity, storativity and hydraulic conductivity are parameters that describe the flow characteristics of an aquifer. The transmissivity of an aquifer is defined as the rate at which water is transmitted through a unit width of aquifer under a unit hydraulic gradient. Thus, the transmissivity (T) of an aquifer is a measure of the ability of an aquifer to transmit water and is given in square feet per second (ft^2/s). The hydraulic conductivity (K) is the volume of water that will flow through a unit area of material in one unit of time under a unit hydraulic gradient and is expressed in feet per second (ft/s). Thus, for an aquifer with a uniform hydraulic conductivity, the transmissivity is the hydraulic conductivity multiplied by the thickness of the aquifer. The storativity (S) of an aquifer, also known as the storage coefficient, is a measure of the ability of the material to store water. It is defined as the volume of water released from a column of aquifer of unit area for a unit decline in the head, and is dimensionless.

The most common method of measuring the hydrogeologic parameters of an aquifer (T, K and S) is through an aquifer test. A description of aquifer test methods along with a discussion of analysis techniques and assumption can be found in most ground-water texts, for example, Freeze and Cherry (1979, p. 314-355). The aquifer test data available for this report were analyzed using the Jacob method. More sophisticated analysis techniques were used on the data from the Proctor and Gamble and the Gracewood State Hospital aquifer tests. Table 1 lists the aquifer parameters obtained from analysis of the aquifer test data. All of the values in Table 1 are for the basal Cretaceous aquifer except for wells

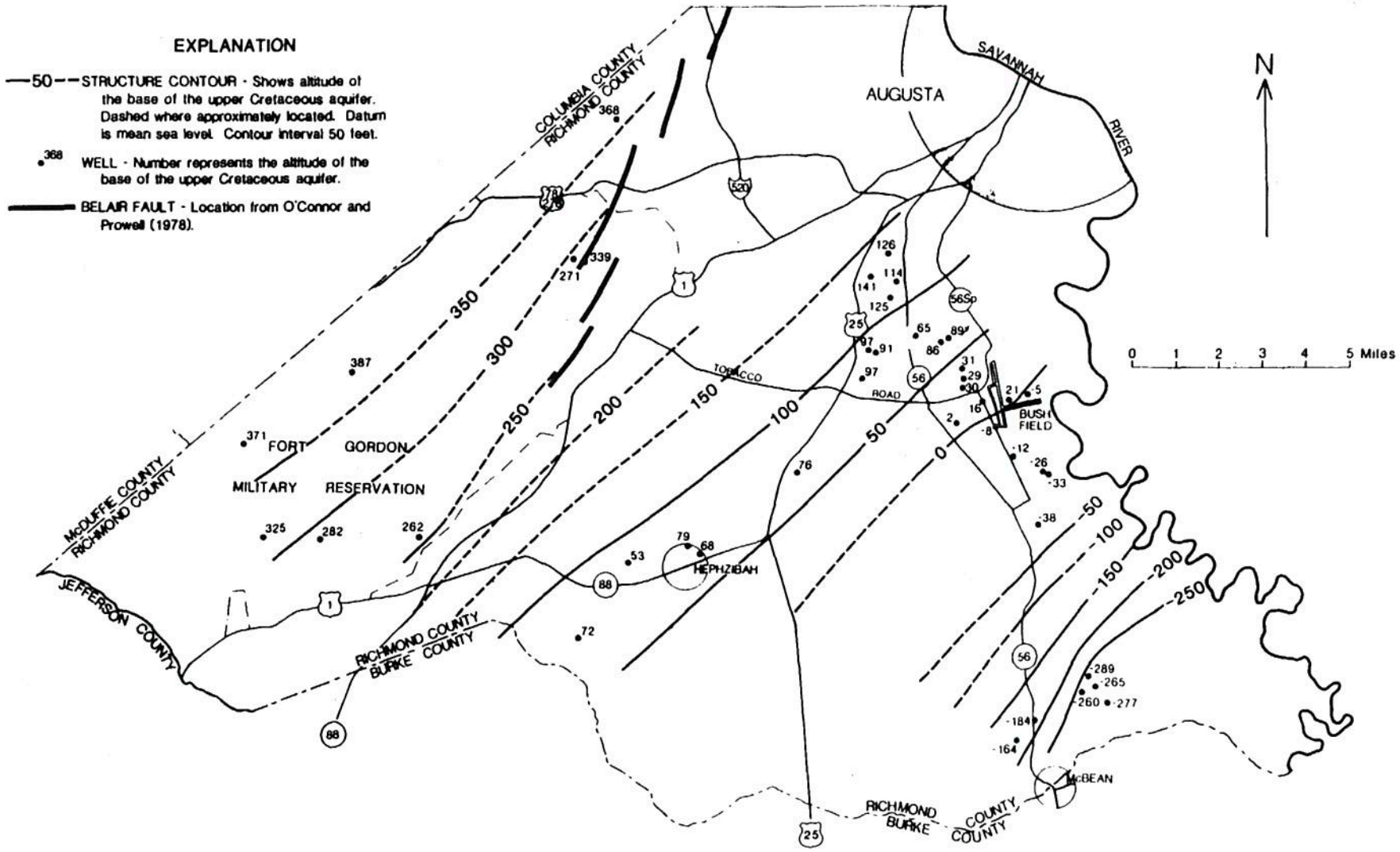

Figure 11. Structure-contour map of the base of the upper Cretaceous aquifer.

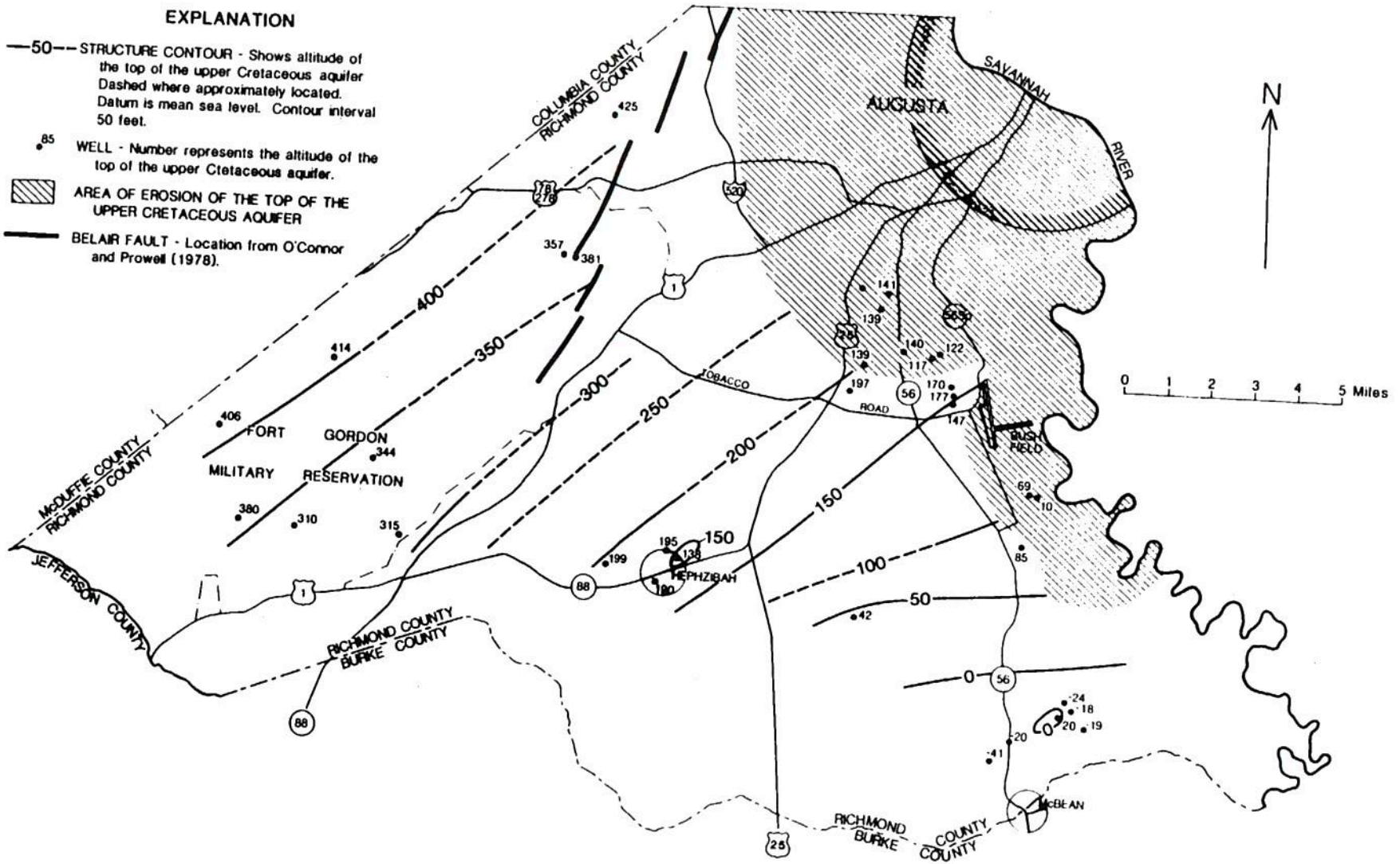

Figure 12. Structure-contour map of the top of the upper Cretaceous aquifer.

GROUND-WATER FLOW

Ground water flows from areas of high potential energy to areas of low potential energy. The water table represents the potential energy of ground water in an unconfined aquifer. In a confined aquifer, the potentiometric head represents the potential energy. The potentiometric head is the level to which water will rise in a tightly cased well. For the purpose of this report the potentiometric head is assumed to be the static water level in a properly constructed well. The potentiometric surface of an aquifer represents the potentiometric head at all points in that aquifer.

Figure 18 is a map showing the potentiometric surface of the basal Cretaceous aquifer. Ground water generally flows from the western part of the study area toward the east (down the potentiometric gradient). Recharge to the basal Cretaceous aquifer is concentrated in the western part of the study area. Natural recharge occurs as infiltration of precipitation directly into the sediments that comprise the aquifer or as downward leakage through overlying units. The aquifer test data presented earlier indicate that recharge to the basal Cretaceous aquifer is induced through overlying confining beds during pumping.

In the northwestern part of the study area, the basal Cretaceous aquifer is at or near the surface. As a result, the aquifer is hydraulically connected to local streams. Although the streams can recharge the aquifer while at high stage, the local streams are usually an area of discharge from the aquifer. As a result, in the area where the basal Cretaceous aquifer is at or near the surface, the potentiometric surface of the aquifer is thought to be a subdued expression of the land surface. This is indicated in Figure 18 by the irregular shape of the potentiometric contours in the northwestern part of the study area. Toward the southeast, the basal Cretaceous aquifer is more deeply buried and the effects of the streams on the ground-water flow are reduced.

Most of the natural discharge from the basal Cretaceous aquifer is into the Savannah River. The effect of the Savannah River on ground-water flow is indicated in Figure 18 by the large area of ground-water flow toward the river. LeGrand and Pettyjohn (1981) discuss the effect of the Savannah River on ground-water flow in this area. In their discussion they considered all of the Cretaceous sediments to be a single aquifer. Their discussion was based on a potentiometric map by Siple (1960) which included a number of wells screened within sands now known to be within the Huber Formation. Large-scale ground-water withdrawals in eastern Richmond County have altered the natural ground-water flow pattern. A large cone of depression is indicated on Figure 18 at the Richmond County Bush Field well field (wells 101-106). A smaller cone of depression exists at the Olin Corporation plant (well 71). In this area, flow toward the Savannah River has been disrupted. It is possible that in this area, pumpage has caused the Savannah River to recharge the basal Cretaceous aquifer. Although data are not adequate to define a cone of depression, the potentiometric map indicates that pumping at Richmond County's Peach Orchard Road well field (wells 44-48) has also modified ground-water flow.

The effects of the Belair Fault zone on the hydrogeology and ground-water flow are not known. Assessing the effects of the fault would be difficult, requiring a canvassing of domestic wells. Faye (personal commun.) suggests that the flowing wells reported on page 99 of LeGrand and Furcron (1956) flow because the basal Cretaceous aquifer is truncated by the Belair Fault, which runs to the east of these wells. The Lassiter well of LeGrand and Furcron (1956, p. 99; number 5 and well 140 on Plate 1) still flows, indicating that in the area around the Lassiter well, water levels have not declined appreciably since the mid 1950's.

Records of long-term water-level fluctuations offer valuable insight into the effects of ground-water withdrawals on an aquifer. Only one well in the study area is equipped with a water-level recorder. This well, near McBean (well 60), taps the upper Cretaceous aquifer. The monthly mean water level has not varied more than 2 feet since the installation of the recorder in June, 1979. This lack of fluctuation may be the result of the limited use of the upper Cretaceous aquifer. This record of water-level fluctuations without the effects of large-scale pumping may be an important tool in assessing the impact of future development of this aquifer.

The lack of a continuous, long-term record of water levels in the basal Cretaceous aquifer in the study area makes it difficult to assess the effects of the current withdrawals. Records of static water levels reported to the Water Resources Management Branch of the Georgia Environmental Protection Division by permitted users, as well as periodic water-level measurements made by U.S. Geological Survey and Georgia Geologic Survey personnel, do not indicate a consistent, county-wide trend of declining water levels.

Comparison of the May, 1983, water-level measurements used in the construction of Figure 18 with the static water levels recorded when the wells were drilled provides an estimate of the net water level change. However, these comparisons can be misleading in a number of ways. For instance,

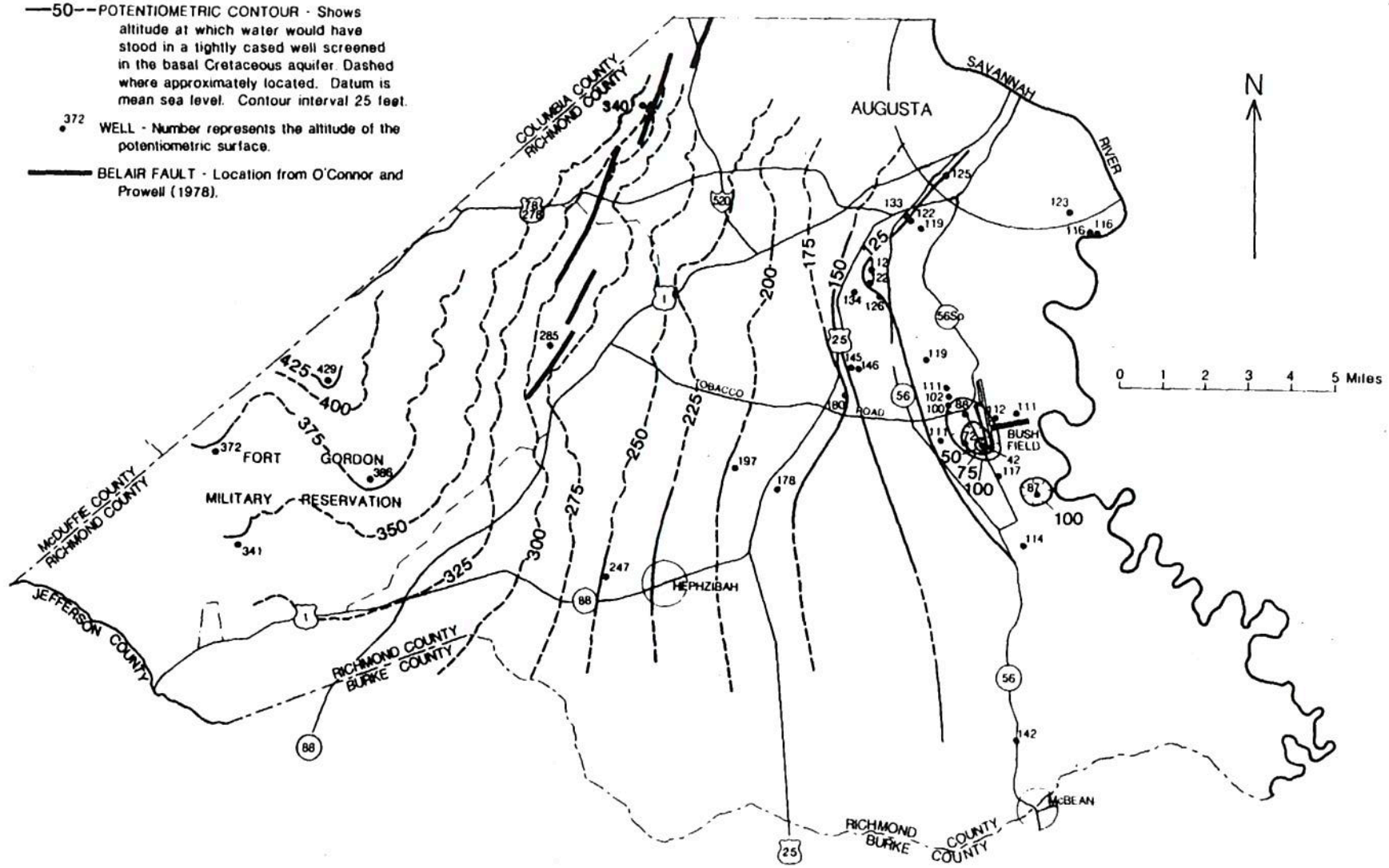

Figure 18. Potentiometric map of the basal Cretaceous aquifer, May 1983.

because the wells in the study area were drilled over a period of many years, the original static water levels for nearby wells may be widely different. For example, the static water level for well 58 was 8 feet when the well was drilled in June, 1953, whereas the static water level for well 34, about 500 feet away, was 20 feet when the well was drilled in June, 1974. The water levels in wells 32, 74 and 75, near Hephzibah, have declined over 15 feet between the time that they were drilled (April, 1967, October, 1972, and April, 1974, respectively) and May, 1983. In November, 1982, the water level in the Albion mine well (well 32) was at approximately the same level it was when the well was drilled in April, 1967. However, between November, 1982, and May, 1983, the water level in this well dropped 16 feet. It is not known whether this decline is a normal seasonal fluctuation for this area.

In general, water levels have declined in the industrial district. The axis of this decline in water levels runs from the Olin plant (well 42) to the Peach Orchard Road well field (wells 44-48). The greatest declines have occurred in the vicinity of the airport well field (including Transco Textiles, wells 77-79). In this area, a water-level decline of over 30 feet has been noted. A water-level decline of over 20 feet has been documented between August, 1964, and May, 1983, at the Olin plant (well 42). Water level declines north-northwest of the Bush Field -Transco area are generally smaller. At the Peach Orchard Road well field, water levels have declined approximately 25 feet.

GROUND-WATER AVAILABILITY

Ground water is available in at least moderate amounts throughout the study area. The lowest reported yield was 13 gal/min for well 80 at Mirror Lake on the Fort Gordon reservation. This low yield is probably a function of the use of an inefficient PVC screen, the thinness of the permeable zone in the updip area, and the lack of necessity for larger quantities. Several wells reported yields of 800 gal/min or more.

Most of the high capacity wells in the study area tap the basal Cretaceous aquifer. Use of the upper Cretaceous aquifer becomes more feasible downdip due to the increased construction costs for basal Cretaceous aquifer wells, the general thickening of the upper aquifer, and the thinning of the basal Cretaceous aquifer. Few wells tap the upper Cretaceous aquifer at this time. However, as the Augusta area expands, use of water from the upper Cretaceous aquifer for industrial and municipal uses will increase.

Wells yielding several hundred gallons per minute or more can be developed within the basal Cretaceous aquifer in all areas except the northwes portion of the study area, where the aquifer is ver shallow, and downdip from Continental Fores where the basal Cretaceous aquifer thins. Th aquifer test data suggest that in the downdip area the basal Cretaceous aquifer becomes less permeab in addition to thinning. However, in the downdi areas, the upper Cretaceous aquifer can also b tapped to increase the well yield. Because of th length of screen necessary to produce high capac ties, these wells are expensive. Aquifer test dat indicate that the transmissivity would still be lov even with the great thickness of permeable materi being tapped.

The potentiometric data in Figure 18 indicat that in the area of large industrial and municip withdrawals along the eastern portion of Richmon County, the basal Cretaceous aquifer is heavil stressed. Major new withdrawals in this area woul further stress the aquifer, resulting in greate water-level declines. Problems that may result fro declining water levels include reduced yields, highe pumping costs and possible damage to wells an pumps. In central and southern Richmond Count and in the northern part of Burke County, th ground-water system is not heavily stressed, and a result, ground water is readily available in th area.

In the northwestern part of the study area, th ground-water availability is not well known becaus of a relative lack of wells with complete informatio Well records of wells 127, 128,and 129 indicate tha yields of approximately 40 gal/min can be obtaine in this area. With proper construction and develop ment, higher yielding wells might be possible. Th potential yields in this area are lower than in oth parts of the study area due to the thinness of th permeable zones.

Leakage through the confining bed overlyin the basal Cretaceous aquifer reduces the drawdow in the aquifer as well as reducing the radius influence. As a result, wells can pump more wat while producing the same drawdown. In additio well spacing can be reduced. Therefore, vertic leakage is an important source of the water bein pumped in the study area. As water use grows, s will the amount of leakage from the upper Creta ceous aquifer and even the Savannah River.

WATER QUALITY

The quality of ground water within the Creta ceous sediments in the study area is generally goo Table 4 contains the results of 25 water-qualit analyses from 23 wells in the study area. Of these 2 wells, 15 are open to the basal Cretaceous aquife only, 7 are open to both the basal ar

Another indication of increasing water use is the increased number of irrigation systems in the study area. Figure 22 is a graph showing the increase in the number of irrigation systems in Richmond and Burke Counties. Although this includes areas outside the study area, it is indicative of the increase in the amount of water used for irrigation in the study area.

Although the general trend is toward greater water use, there are fluctuations in water use. Some industries found it necessary to slow production in 1981 and 1982 due to the recessed economy; as a result they used less water. In addition, economic factors delayed projects that would have resulted in greater water use.

Future ground-water use is likely to grow as a result of continuing population growth, expansion of existing industries, establishment of new industries, and continuing growth in the use of irrigation. For example, the Richmond County Water System has projected a demand of 20 Mgal/d in 1995 (Robert Pierce, written commun). In 1980 the county's pumpage averaged 10.3 Mgal/d.

At least 72 percent of the ground water used within the study area is taken from the basal Cretaceous aquifer (the 72 percent figure assumes that the basal Cretaceous aquifer supplies none of the estimated 7.1 Mgal/d area-based water use). Plant Vogtle and the town of Blythe withdraw from the upper Cretaceous aquifer. Hephzibah's wells tap both the basal and upper Cretaceous aquifers. All other permitted users tap the basal Cretaceous aquifer.

The estimate of water use for agricultural purposes for 1980 probably was outdated soon afterward due to the increase in the use of irrigation in the study area. In 1982 the Georgia Legislature enacted legislation (House Bills 1109 and 1110) that requires farmers using more than 100,000 gal/d for irrigation to report their use (no permit is required). Farmers may report the number of hours the system was in use, along with information on the capacity of the system instead of the actual number of gallons pumped per month. Preliminary reports did not include use figures (the first set of reports covered only the Fall 1982 season), but information was received for 7 systems within the study area. Subsequent reports should provide more useful information.

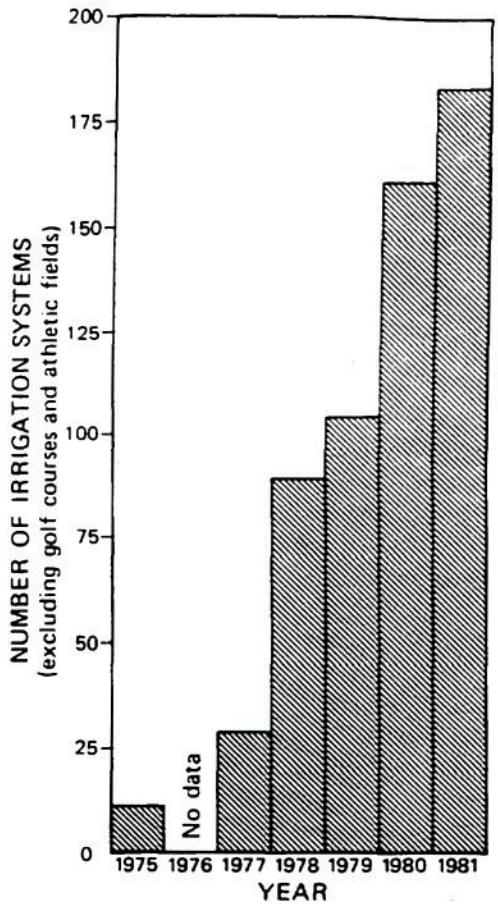

Figure 22. Number of irrigation systems in Burke and Richmond Counties from 1975 to 1981. Data from the Cooperative Extension Service.

CONCLUSIONS

The basal Cretaceous aquifer, the lower of two aquifers within the Gaillard formation, is the main source of ground water in the study area. The aquifer lies at the base of the Coastal Plain sediments, overlying the crystalline rocks of the Piedmont in updip areas and Triassic rocks of the Dunbarton Basin in downdip areas. The basal Cretaceous aquifer is overlain by a clay bed that is thought to be a weathered zone within the Gaillard formation.

The second aquifer within the Gaillard formation is the upper Cretaceous aquifer. It overlies the clay bed that caps the basal Cretaceous aquifer and underlies the clay that marks the weathered zone at the top of the Gaillard formation. Both the basal and upper Cretaceous aquifers are composed of sand and gravel with minor amounts of interspersed clay.

The regional dip in the study area is to the southeast. The basal Cretaceous aquifer thickens downdip to a maximum of approximately 150 feet. Farther downdip the aquifer thins somewhat. Available data indicate that the upper Cretaceous aquifer thickens downdip. Throughout much of the study area, the upper Cretaceous aquifer is either exposed

at the surface or is hydraulically connected to alluvial deposits.

In 1980, ground-water use in the study area was approximately 26.5 Mgal/d. Most of this withdrawal was taken from the basal Cretaceous aquifer in the eastern industrial area of Richmond County.

Aquifer test data indicate that transmissivities range from about 2.6×10^{-2} ft²/s to 2.0×10^{-1} ft²/s in the basal Cretaceous aquifer. In addition, tests at the Gracewood State Hospital and at Proctor and Gamble indicate that the basal Cretaceous aquifer receives leakage through the overlying confining bed during pumping. Without this vertical leakage, the concentrated, large-scale pumping in the eastern industrial area would result in larger drawdowns than have been noted. The limited aquifer test data suggest that the aquifer becomes less permeable downdip; however, more data would be necessary to confirm this trend.

Potentiometric data indicate that regional ground-water flow is from west to east. Recharge to the aquifer is from direct infiltration and from seepage through overlying units. Under natural conditions, the basal Cretaceous aquifer discharges into the Savannah River. However, the concentrated pumpage in the industrial district has disrupted this flow pattern. A cone of depression has developed around the Richmond County airport well field. A smaller cone of depression has formed at the Olin plant. Water-level declines have been noted in the industrial areas of Richmond County. However, throughout most of Richmond County, no long-term water-level decline has been documented.

Ground water from the basal and upper Cretaceous aquifers is acidic. The acidity is due to dissolved carbon dioxide. In many water systems the water is treated with lime or lye to neutralize the pH and to make the water less corrosive. In some locations iron and manganese are above the EPA drinking water limits and present a problem with staining of clothes.

Large quantities of ground water are available throughout most of the study area. Well yields in the northwestern part of the study area are lower than in other areas due to the thinness of the aquifer. The basal Cretaceous aquifer is stressed in the industrial area of eastern Richmond County. There has been little development of the upper Cretaceous aquifer in southern Richmond County and northern Burke County. Overlying units within the study area yield smaller quantities of water, and as a result are seldom used as a source of ground water.

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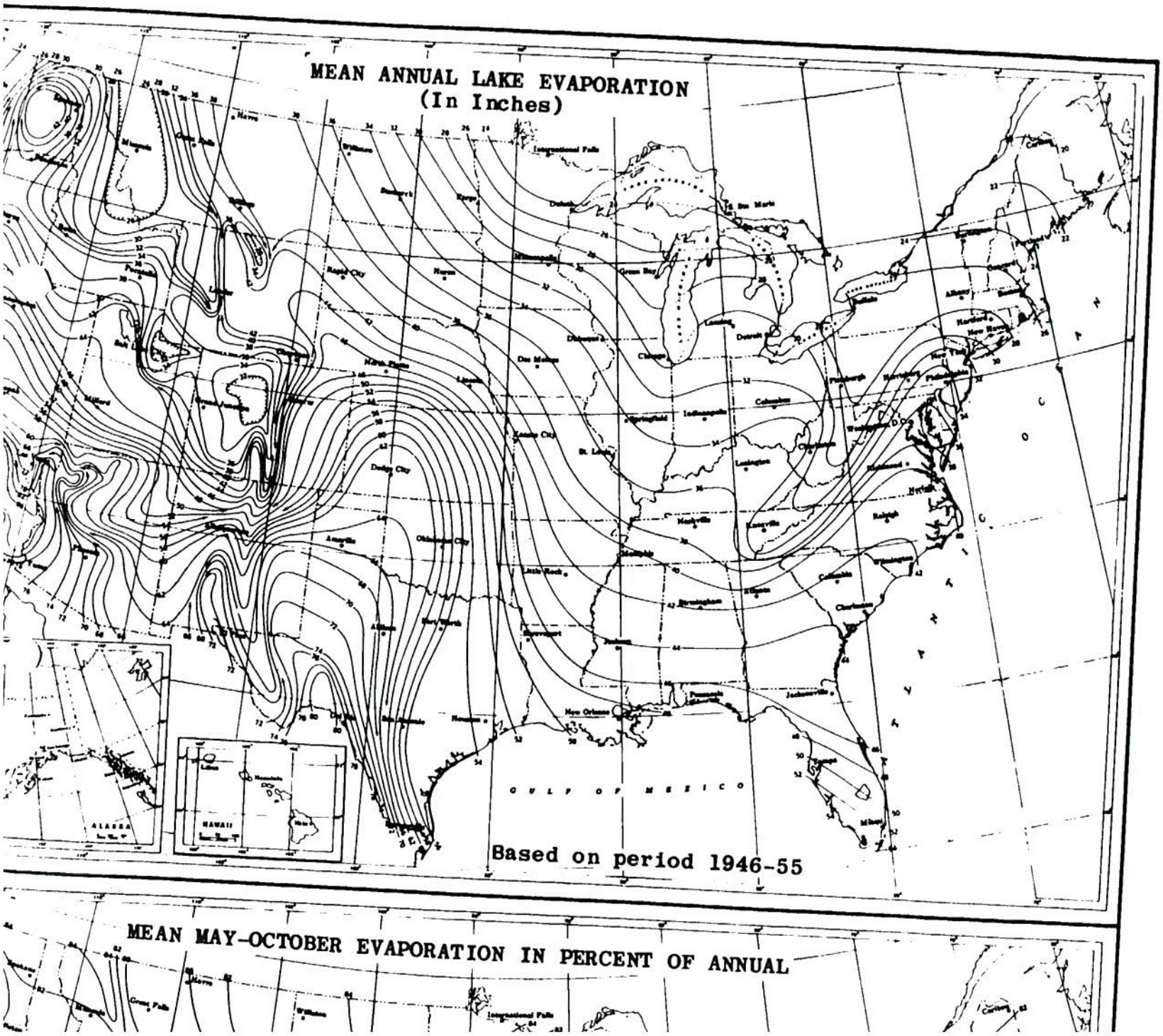
APORATION


MEAN ANNUAL LAKE EVAPORATION
(In Inches)
GULF OF MEXICO
ALASKA
HAWAII
Based on period 1946-55
MEAN MAY-OCTOBER EVAPORATION IN PERCENT OF ANNUAL

ON (inches) BY STATE CLIMATIC DIVISIONS

"Rite in the Rain"
WEATHERPROOF

LEVEL

NOTEBOOK NO. 311

840
F4-6486

Textron, Inc.

Site Reconnaissance

Steve Walker

Kent Hawkinson

F4-8804-65

a product of
J. L. DARLING CORPORATION
COMAX, WASHINGTON 98421 U.S.A.

LOGBOOK REQUIREMENTS
REVISED - JANUARY 6, 1988

NOTE: ALL LANGUAGE SHOULD BE FACTUAL AND OBJECTIVE

1. Record on front cover of the Logbook:

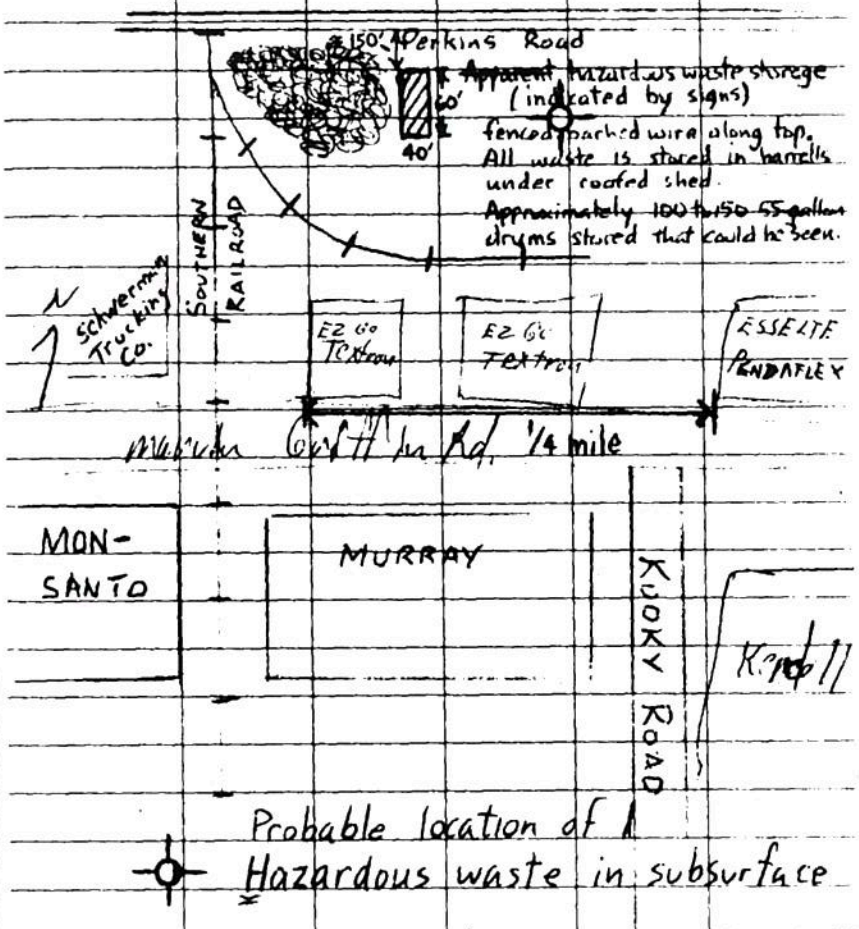
   TDD No., Site Name, Site Location, Project Manager

2. All entries are made using ink.
3. Provide statement referencing Equipment Location Log.
4. Statement of Work Plan, Study Plan, and Safety Plan discussion and distribution to field team with team member signatures.
5. Sign and date each page. Project Manager is to review and sign off on each logbook daily.
6. A single line is drawn through error. Each correction is dated/initialed.
7. Report weather conditions. Provide general site description and remarks.
8. Document all changes from project planning documents.
9. Provide a site sketch with sample locations.
10. Document all calibration and pre-operational checks of equipment.
11. Provide reference to Sampling Field Sheets for detailed sampling informaiton.
12. Maintain photo log by completing the stamped information at the end of the logbook.
13. If no site representative is on hand to accept the receipt for samples an entry to that effect must be placed in the logbook.

5-3-88

Arrive to

1630 Take photographs of Textron from Marvin Griffin Road



P Kent Hankinson

01

5-3-88

1650 Photos taken from Southern Railroad Tracks toward facility facing northeast, east and southeast (35 mm and polaroid)

1700 Photo taken NE across sea of carts (35mm)

bo Began search for nearest private well
(b)(6) Personal Privacy
possible
3515 Jonathan Circle MEI

Alternate MEI @ 3507 Jon. Circle

1800 End of day Return to hotel

Note: City of Augusta water lines were marked with the assistance of Fred Gary on 5-3-88. County of Richmond water lines were marked with the assistance of Millard Morgan on [illegible] City lines are marked in on topo and county lines in blue.

02

5-4-88

Summary of TEXTRON RECON

1) Location of TEXTRON is on Marvin Griffin Road between Old Savannah Road and New Savannah Road.

2) Description of site -
TEXTRON EZ GO produces golf carts and is composed of ~~three~~ two main buildings facing Marvin Griffin and one near Perkins Road. There is a fenced, covered hazardous waste storage area containing over 100 55-gallon drums and a *subsurface (buried) source of haz waste beneath a small shack in the middle of the golf cart parking lot.

* Possible (Officially closed according to CPA file)

03

5-5-88

Summary (cont'd)

3) Surrounding businesses - Esselte Pendaflex, Monsanto, Murray, Kendall, Schuerman Trucking Company.

4) It is not known if there is an onsite well.

5) Nearest well - (b)(6) Personal Privacy
Route 3 Box 260, Augusta GA
(This house is off of ~~Blanchard Road~~ Dixon Airline Hwy) PWS 5-4-88

6) Nearest residence - (b)(6) Personal Privacy
3515 Jonathan Circle
Augusta, GA 30906

7) Nearest school - State Training School

8) Nearest church - Spirit Creek

* Access to this house is by a dirt road having an old grade toward the western end of an area of sandy clay filled with erosional gullies. This road is off Dixon Airline Highway

Ann Tickle

04

5-5-88

Addendum:

On 5-3-88 it was learned that City of Augusta water is surface water drawn from Augusta City Lock and Dam along the Savannah River. 26 million gallons per day is pumped from the river 11 miles NNW of the site.

County of Richmond water is groundwater drawn from 25 wells around Richmond County. Total depths range from 84 to 312 feet.

City of Augusta Water Contact:
Fred Gary

County of Richmond Contact
Millard Morgan

Ann Tickle

05

NUS CORPORATION AND SUBSIDIARIES — **TELECON NOTE**

CONTROL NO.	DATE: 1-2-88	TIME: 2:00
DISTRIBUTION:		
BETWEEN: David Hargrove	OF: James G. Swift and Assoc. Consulting Engrs for Richmond Cty	PHONE: (404) 733-7775
AND: David Upthegrove DCJ 1-12-88		

DISCUSSION:

Hargrove informed me that all 25 of the Richmond County wells produce from the basal Cretaceous aquifer. An average of about 30 feet of confining clay was encountered during the drilling of these wells.

FOR THE YEAR 1997....

TABLE
RICHMOND COUNTY WATER SYSTEM
WATER TREATMENT PLANT NO. 1 SUPPLY WELLS – **REFERENCE 8**

Well No.	Site Location	Depth (feet)	Capacity (gallons/min.)
2	Roses Parking Lot U.S. Hwy.25	88	334
3	Benson Road (Treatment Plant No. 1)	87	252
5	Coleman Avenue	86	266
7-A	Chester Avenue	82	781
10	Lumpkin Road	85	655
11	Kings Grant/ Blueberry Drive	85	692
12	Windsor Spring Road	110	575
13	Windsor Spring Road/ RR Track	125	375
14	Louisville Road/ Bobby Jones Exp.	100	725
15	Louisville Road/ Georgia Regional	130	379
16	Melrose Drive/ Ballfield	113	1,032
17	Louisville Road	130	530
18	Rhonda Drive	117	495
19	Deeb Drive	84	788
	EXISTING TOTAL WELL SUPPLY VOLUME----------		**7,879 G.P.M.**

TABLE
RICHMOND COUNTY WATER SYSTEM
WATER TREATMENT PLANT NO. 2 SUPPLY WELLS

Well No.	Site Location	Depth (feet)	Capacity (gallons/min.)
101	Georgia Hwy. #56 Loop	231	888
102	Georgia Hwy. #56 Loop	231	888
103	Georgia Hwy. #56 Loop	239	776
104	Georgia Hwy. #56 Loop	243	922
105	4-H Club Road (Treatment Plant No. 2)	250	948
106	4-H Club Road	254	800
107	4-H Club Road	291	800
108	4-H Club Road	312	500
	EXISTING TOTAL WELL SUPPLY VOLUME-------		**6,522 G.P.M.**

TABLE
RICHMOND COUNTY WATER SYSTEM
PINE HILL WELLS

Well No.	Site Location	Depth (feet)	Capacity (gallons/min.)
PH.-1	Brown Road	256	450
PH.-2	Plantation Road	195	400
PH.-3	Old Waynesboro Road	258	780
	EXISTING TOTAL WELL SUPPLY VOLUME-------		**1,630 G.P.M.**

REFERENCE

NUS CORPORATION AND SUBSIDIARIES — TELECON NOTE

CONTROL NO.	DATE: June 8, 1988	TIME: 1620

DISTRIBUTION:

BETWEEN: Brian Richards, Assistant Superintendant	OF: Richmond County Water System	PHONE: (404) 796-5000

AND: Robert Hutcheson, NUS Corporation

DISCUSSION:

The phone call concerned the distribution of water from individual wells that supply water treatment plants No. 1 and No. 2. Water from the fourteen supply wells for plant No. 1 is mixed into one common supply before distribution as is the case for the eight wells that supply plant No. 2. Water from both plants is also intermixed whenever the pressure from one plant is too high for its distribution lines, with the excess water being shunted to the other water treatment plant.

The address for water treatment plant No. 1 is 2760 Peach Orchard Road. All supply wells for this plant are within a one mile radius. Plants No. 1 and No. 2 serve 22,000 connections.

REFERENCE 10

NUS CORPORATION AND SUBSIDIARIES — TELECON NOTE

CONTROL NO:	DATE:	TIME:
	June 10, 1988	1545 hrs.

DISTRIBUTION:

FILE

BETWEEN:	OF:	PHONE:
Detles Holderfield Conservation Ranger 1st class	Georgia Game & Fish Division	(404) 595-4211

AND:

Steve Walker - NUS Corp.

DISCUSSION:

I called Mr. Holderfield to inquire about the fishing locations for persons in the Augusta area. Mr. Holderfield stated that Phinizy Swamp is fished to a very limited extent by local landowners and nearby residents. He stated that people fish frequently at the confluence of Butler Creek and the Savannah River. He also indicated that local residents fish at a small lake (locally known as airport pond), which may receive at least some of its water from Butler Creek. This pond is located just north of Bush Field (airport) and immediately east of the intersection of New Savannah Road and Butler Creek.

ACTION ITEMS:

NUS 067 REVISED 0685

United States Environmental Protection Agency

Office of Emergency and Remedial Response
Washington, DC 20460

EPA Form 2070-13
July, 1981

EPA

Potential Hazardous Waste Site

Site Inspection Report

Site Inspection Report

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

EPA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
GA	D003302064

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Textron, Inc.	1451 Marvin Griffin Road				
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 COUNTY**	**07 COUNTY CODE**	**08 CONG DIST**
Augusta	GA	30913	Richmond	245	10

09 COORDINATES LATITUDE 33° 23' 55.0" LONGITUDE 081° 59' 26.0"

10 TYPE OF OWNERSHIP (Check one)
☒ A. PRIVATE ☐ B. FEDERAL _____ ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION: 05 / 3 / 88 (MONTH DAY YEAR)

02 SITE STATUS: ☒ ACTIVE ☐ INACTIVE

03 YEARS OF OPERATION: unknown (BEGINNING YEAR) Present (ENDING YEAR) ☐ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)
☐ A. EPA ☒ B. EPA CONTRACTOR NUS Corp (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☐ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☐ G. OTHER _____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Steve Walker	Geologist	NUS Corp	(404) 938-7710
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO.**
Kent Hankinson	Geologist	NUS Corp	(404) 938-7710
			( )
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
N/A			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
N/A ☐ PERMISSION ☐ WARRANT		

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
Daniel L. Howard	NUS Corporation	(404) 938-7710

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Daniel L. Howard	NUS Corp		(404) 938-7710	/ / (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
GA	D003302064

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☒ C. SLUDGE
- ☐ D. OTHER (Specify)
- ☐ E. SLURRY
- ☐ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE
(Measures of waste quantities must be independent)

TONS: 5 1/4
CUBIC YARDS:
NO. OF DRUMS: 131-Max Cat.

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A. TOXIC
- ☒ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☒ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	5 1/4	tons	treated annually
OLW	OILY WASTE			
SOL	SOLVENTS	10,165	gallons	annually
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

GA EPD State Files
RCRA Part A Application

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
GA	D003302064

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☑ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 83910 — 04 NARRATIVE DESCRIPTION

Richmond County Water System supplies water to 22,000 connections. All of Richmond County Water System 25 well are inter-connected. The Youth Development Center and the Regional Youth Development Center have private wells that supply water to 310 persons.

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: None — 04 NARRATIVE DESCRIPTION

DLH
~~Agusta~~ Augusta obtains it water from a intake at the Augusta City Lock and Dam along the Savannah River which is 11 miles upstream of the facility

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

N/A

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

N/A

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: Workers — 04 NARRATIVE DESCRIPTION

Workers involved in handling the solvents and waste

01 ☐ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: 1-27-83) — ☐ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: 0.018 (Acres) — 04 NARRATIVE DESCRIPTION

E-2-GO Textron contracted Applied Engineering and Science for closure of the abandoned chromic facility.

01 ☑ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 83600 — 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: Unknown — 04 NARRATIVE DESCRIPTION

Workers involved in handling the solvents and waste

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

None

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
GA	D003302064

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No evidence of damage

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

No evidence of damage

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No evidence of contamination

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/Runoff/Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

No evidence of improper containment

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

N/A

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

N/A

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

N/A

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

None

III. TOTAL POPULATION POTENTIALLY AFFECTED: 83600

IV. COMMENTS

This is a TSD regulated facility.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

GA EPD States files
Log Book F4-840

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
GA	D003302064

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☑ G. STATE (Specify) DNR EPD	HW-012(5)(T)	9-28-84	9-28-94	
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☑ C. DRUMS, ABOVE GROUND	9295	gallons
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☑ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER (Specify)

05 OTHER

- ☑ A. BUILDINGS ON SITE

06 AREA OF SITE

_____ (Acres)

07 COMMENTS

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☑ A. ADEQUATE, SECURE ☐ B. MODERATE ☐ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

D

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☐ YES ☑ NO

02 COMMENTS

The ~~facility~~ waste storage area is surrounded by a fence.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

EPA file material; Environmental Protection Division (DNR) Log Book F4-840 Hazardous Waste Facility Permit

EPA FORM 2070-13 (7-81)

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
GA	D003302064

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)	SURFACE	WELL
COMMUNITY	A. ☑	B. ☑
NON-COMMUNITY	C. ☐	D. ☒

02 STATUS	ENDANGERED	AFFECTED	MONITORED
	A. ☐	B. ☐	C. ☐
	D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE
A. 11 (mi)
B. 1.5 (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☑ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 83,600

03 DISTANCE TO NEAREST DRINKING WATER WELL 1.25 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
(ft)	DLH ~~Est~~ east-southeast	84 (ft)	23.1×10^6 (gpd)	☐ YES ☑ NO

09 DESCRIPTION OF WELLS (Including useage, depth, and location relative to population and buildings)
All of Richmond County Water System well are completed in the basal Cretaceous aquifer. These 25 well have a depth range of 84 to 312 feet.

10 RECHARGE AREA		11 DISCHARGE AREA	
☐ YES ☐ NO	COMMENTS	☐ YES ☐ NO	COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☑ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
Butler Creek	☐	0.4 (mi)
Phinizy Swamp	☐	2.7 (mi)
Savannah River	☐	2.8 (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. DLH 8042 NO. OF PERSONS	B. 28/5 NO. OF PERSONS	C. 24500 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION
DLH
~~to~~ 0.7 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE	04 DISTANCE TO NEAREST OFF-SITE BUILDING
48	.08 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)
There are very few people living within close vicinity of the facility. The majority of the area is industrial.

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
GA	D003302064

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☑ B. $10^{-4} - 10^{-6}$ cm/sec ☐ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☑ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH	
_____ (ft)	unknown (ft)	_____	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE		
		SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
2 (in)	3.5 (in)	_____ %	East-southeast	0.5 %

09 FLOOD POTENTIAL

SITE IS IN _____ YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE	OTHER
A. _____ (mi)	B. 0.76 (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

_____ (mi)

ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS PRIME AG LAND	AGRICULTURAL LANDS AG LAND
A. 0.076 (mi)	B. 1.2 (mi)	C. _____ (mi)	D. _____ (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The facility is located 0.4 miles north of Butler Creek 0.7 miles west-southwest of Phinizy Swamp, and 2.8 miles northwest of the Savannah River. The land surrounding the site two miles consists of a downward slope toward Phinizy Swamp on the east and a downward slope toward Butler Creek to the south. There are claypits about 0.7 miles south of the facility.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

USGS 7.5 Topographic Quadrangle of Augusta East, GA-S.C

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
GA	D003302064

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☑ GROUND ☐ AERIAL

02 IN CUSTODY OF NUS Corporation (Name of organization or individual)

03 MAPS ☑ YES ☐ NO

04 LOCATION OF MAPS Mechanicsville, GA-S.C.; Hephzibah, GA; Augusta East, GA-S.C.; Augusta West, GA

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

USGS Topographic Quadrangles

NUS field reconnaissance (photographs), Log Book F4-840

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
GA	D003302064

II. CURRENT OWNER(S) / PARENT COMPANY (If applicable)

CURRENT OWNER(S)				PARENT COMPANY (If applicable)			
01 NAME: E-Z-Go Textron		02 D+B NUMBER:		08 NAME: Textron Incorporated		09 D+B NUMBER:	
03 STREET ADDRESS (P.O. Box, RFD #, etc.): 1451 Marvin Griffin Rd		04 SIC CODE:		10 STREET ADDRESS (P.O. Box, RFD #, etc.): 40 Westminster Street		11 SIC CODE:	
05 CITY: Augusta	06 STATE: GA	07 ZIP CODE: 30913		12 CITY: Providence	13 STATE: RI	14 ZIP CODE: 02903	
01 NAME		02 D+B NUMBER		08 NAME		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE		12 CITY	13 STATE	14 ZIP CODE	
01 NAME		02 D+B NUMBER		08 NAME		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE		12 CITY	13 STATE	14 ZIP CODE	
01 NAME		02 D+B NUMBER		08 NAME		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE		12 CITY	13 STATE	14 ZIP CODE	

III. PREVIOUS OWNER(S) (List most recent first) / IV. REALTY OWNER(S) (If applicable; list most recent first)

III. PREVIOUS OWNER(S)			IV. REALTY OWNER(S)		
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA file material (EPA Form 2070-12)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
GA	D003302064

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
E-Z-Go Textron	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
1451 Marvin Griffin Rd	

05 CITY	06 STATE	07 ZIP CODE
Augusta	GA	30913

08 YEARS OF OPERATION	09 NAME OF OWNER
unknown	

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER
Textron Incorporated	

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
40 Westminster Street	

14 CITY	15 STATE	16 ZIP CODE
Providence	RI	02903

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA file material (EPA Form 2070-12)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
GA	D003302064

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
E-Z-Go Textron	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
1451 Marvin Griffin Rd	

05 CITY	06 STATE	07 ZIP CODE
Augusta	GA	30913

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA file material (EPA Form 2070-12)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION
01 STATE: GA | 02 SITE NUMBER: D003302064

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ D. SPILLED MATERIAL REMOVED
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☑ E. CONTAMINATED SOIL REMOVED
02 DATE 6-23-83 (proposal for removal) 03 AGENCY Applied Engineering and Science
04 DESCRIPTION

01 ☐ F. WASTE REPACKAGED
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
unknown

01 ☐ G. WASTE DISPOSED ELSEWHERE
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
unknown

01 ☐ H. ON SITE BURIAL
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
no

01 ☐ I. IN SITU CHEMICAL TREATMENT
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ J. IN SITU BIOLOGICAL TREATMENT
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ K. IN SITU PHYSICAL TREATMENT
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ L. ENCAPSULATION
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION

01 ☐ M. EMERGENCY WASTE TREATMENT
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION

01 ☐ N. CUTOFF WALLS
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ P. CUTOFF TRENCHES/SUMP
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ Q. SUBSURFACE CUTOFF WALL
02 DATE _____ 03 AGENCY _____
04 DESCRIPTION
N/A

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
GA	D003302064

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE 5-3-88 — 03 AGENCY NUS Corp.
04 DESCRIPTION: Hazardous waste storage area is fenced in with barbed wire along top of fence

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION:

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analyses, reports)

EPA File material (Applied Engineering and Science - proposal for removal)
Log Book (F4-840)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
GA	D003302064

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☑ YES ☐ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION Facility Permit No. HW-012(S)(T)
1-15-87

(1) Section I.A.1 - Failure to treat + store hazardous waste in accordance with the conditions of the Permit. (2) Section I.D.3 - Failure to comply with all conditions of the Permit. (3) Section I.D.8 - Failure to notify the Director of any changes at your facility that would have resulted in a violation of any Permit conditions. (4) Section I.E.1 - Failure to follow the procedures in the contingency plan which require amending the plan when necessary, and for failure to update the personnel training program. (5) Section I.E.2 - Failure to amend the contingency plan as required. (6) Section II.A - Storage of waste outside the areas authorized by the Permit.

It was also observed that the facility were in violation of the following provisions of the Rules:

40 CFR 262.34(a) - Failure to clearly mark containers used for the accumulation of hazardous waste with the words "Hazardous Waste", and with accumulation dates.

40 CFR 264.54 - Failure to amend the contingency plan as required, to show correct emergency coordinators and to show the correct address of the Division.

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analyses, reports)

Georgia Department of Natural Resources (FPD) notice of violation

EPA FORM 2070-13 (7-81)

OVERSIZED

DOCUMENT

MAP

HAZARD RANKING SYSTEM SCORING SUMMARY

FOR

TEXTRON, INC.
EPA SITE NUMBER GAD003302064
AUGUSTA
RICHMOND COUNTY, GA
EPA REGION: 4

SCORE STATUS: IN PREPARATION

SCORED BY DANIEL HOWARD
OF NUS CORPORATION
ON 07/21/88

DATE OF THIS REPORT: 12/13/88
DATE OF LAST MODIFICATION: 12/13/88

GROUND WATER ROUTE SCORE	:	31.22
SURFACE WATER ROUTE SCORE	:	4.76
AIR ROUTE SCORE	:	0.00
MIGRATION SCORE	:	18.25

SITE: TEXTRON, INC. PAGE

HRS GROUND WATER ROUTE SCORE

CATEGORY/FACTOR	RAW DATA	ASN. VALUE	SCORE
1. OBSERVED RELEASE	NO	0	0
2. ROUTE CHARACTERISTICS			
DEPTH TO WATER TABLE	33 FEET		
DEPTH TO BOTTOM OF WASTE	2 FEET		
DEPTH TO AQUIFER OF CONCERN	31 FEET	2	4
PRECIPITATION	44.0 INCHES		
EVAPORATION	42.0 INCHES		
NET PRECIPITATION	2.0 INCHES	1	1
PERMEABILITY	1.0X10-6 CM/SEC	1	1
PHYSICAL STATE		3	3
TOTAL ROUTE CHARACTERISTICS SCORE:			9
3. CONTAINMENT		3	3
4. WASTE CHARACTERISTICS			
TOXICITY/PERSISTENCE:CHROMIUM,TRIVALENT			15
WASTE QUANTITY CUBIC YDS	0		
DRUMS	0		
GALLONS	10165		
TONS	5		
TOTAL	56 CU. YDS	2	2
TOTAL WASTE CHARACTERISTICS SCORE:			17
5. TARGETS			
GROUND WATER USE		3	9
DISTANCE TO NEAREST WELL	6000 FEET		
AND	MATRIX VALUE	30	30
TOTAL POPULATION SERVED	83600 PERSONS		
NUMBER OF HOUSES	0		
NUMBER OF PERSONS	0		
NUMBER OF CONNECTIONS	22000		
NUMBER OF IRRIGATED ACRES	0		
TOTAL TARGETS SCORE:			39

GROUND WATER ROUTE SCORE (Sgw) = 31.22

HRS SURFACE WATER ROUTE SCORE

CATEGORY/FACTOR	RAW DATA	ASN. VALUE	SCORE
1. OBSERVED RELEASE	NO	0	0
2. ROUTE CHARACTERISTICS			
SITE LOCATED IN SURFACE WATER	NO		
SITE WITHIN CLOSED BASIN	NO		
FACILITY SLOPE	1.0 %		
INTERVENING SLOPE	1.0 %	0	0
24-HOUR RAINFALL	3.5 INCHES	3	3
DISTANCE TO DOWN-SLOPE WATER	3000 FEET	2	4
PHYSICAL STATE	3		3
TOTAL ROUTE CHARACTERISTICS SCORE:			10
3. CONTAINMENT	3		3
4. WASTE CHARACTERISTICS			
TOXICITY/PERSISTENCE:CHROMIUM,TRIVALENT			15
WASTE QUANTITY CUBIC YDS	0		
DRUMS	0		
GALLONS	10165		
TONS	5		
TOTAL	56 CU. YDS	2	2
TOTAL WASTE CHARACTERISTICS SCORE:			17
5. TARGETS			
SURFACE WATER USE		2	6
DISTANCE TO SENSITIVE ENVIRONMENTS		0	0
COASTAL WETLANDS	NONE		
FRESH-WATER WETLANDS	NONE		
CRITICAL HABITAT	NONE		
DISTANCE TO STATIC WATER	4000 FEET		
DISTANCE TO WATER SUPPLY INTAKE	> 1 MILE		
AND	MATRIX VALUE	0	0
TOTAL POPULATION SERVED	0		
NUMBER OF HOUSES	0		
NUMBER OF PERSONS	0		
NUMBER OF CONNECTIONS	0		
NUMBER OF IRRIGATED ACRES	0		
TOTAL TARGETS SCORE:			6

SURFACE WATER ROUTE SCORE (Ssw) = 4.76

HRS AIR ROUTE SCORE

CATEGORY/FACTOR	RAW DATA	ASN. VALUE	SCORE
1. OBSERVED RELEASE	NO	0	0

2. WASTE CHARACTERISTICS

REACTIVITY: MATRIX VALUE

INCOMPATIBILITY

TOXICITY

WASTE QUANTITY CUBIC YARDS
DRUMS
GALLONS
TONS

TOTAL

TOTAL WASTE CHARACTERISTICS SCORE: N/A

3. TARGETS

POPULATION WITHIN 4-MILE RADIUS
- 0 to 0.25 mile
- 0 to 0.50 mile
- 0 to 1.0 mile
- 0 to 4.0 miles

DISTANCE TO SENSITIVE ENVIRONMENTS
- COASTAL WETLANDS
- FRESH-WATER WETLANDS
- CRITICAL HABITAT

DISTANCE TO LAND USES
- COMMERCIAL/INDUSTRIAL
- PARK/FOREST/RESIDENTIAL
- AGRICULTURAL LAND
- PRIME FARMLAND
- HISTORIC SITE WITHIN VIEW?

TOTAL TARGETS SCORE: N/A

AIR ROUTE SCORE (Sa) = 0.00

HAZARD RANKING SYSTEM SCORING CALCULATIONS
FOR
SITE: TEXTRON, INC.
AS OF 12/13/88

GROUND WATER ROUTE SCORE

ROUTE CHARACTERISTICS		9
CONTAINMENT	X	3
WASTE CHARACTERISTICS	X	17
TARGETS	X	39

= 17901 /57,330 X 100 = 31.22 = S_{gw}

SURFACE WATER ROUTE SCORE

ROUTE CHARACTERISTICS		10
CONTAINMENT	X	3
WASTE CHARACTERISTICS	X	17
TARGETS	X	6

= 3060 /64,350 X 100 = 4.76 = S_{sw}

AIR ROUTE SCORE

OBSERVED RELEASE 0 /35,100 X 100 = 0.00 = S_{air}

SUMMARY OF MIGRATION SCORE CALCULATIONS

	S	S^2
GROUND WATER ROUTE SCORE (S_{gw})	31.22	974.69
SURFACE WATER ROUTE SCORE (S_{sw})	4.76	22.66
AIR ROUTE SCORE (S_{air})	0.00	0.00
$S^2_{gw} + S^2_{sw} + S^2_{air}$		997.35
$\sqrt{(S^2_{gw} + S^2_{sw} + S^2_{air})}$		31.58
$S_M = \sqrt{(S^2_{gw} + S^2_{sw} + S^2_{air})}/1.73$		18.25

Surface Water Pathway

Are there intakes located on the extended 15-mile migration pathway? None known

Are there recreational areas, sensitive environments, or human food chain targets (fisheries) along the extended pathway? yes - Phinizy Swamp 3/4 mile east of the site. (Ref. USGS Topo. Map Augusta East)

Onsite Exposure Pathway

Is there waste or contaminated soil onsite at 2 feet below land surface or higher? unknown

Is the site accessible to non-employees (workers do not count)? no - entire facility is fenced (Ref. Field Note Book F4-840)

Are there residences, schools, or daycare centers onsite or in close proximity? ~~yes - residences 1000' west.~~ DLH No

Are there barriers to travel (e.g., a river) within one mile? Phinizy Swamp 3/4 mile east of the si (Ref. USGS Topo. Map Augusta East)

RECONNAISSANCE CHECKLIST FOR HRS2 CONCERNS

Instructions: Obtain as much "up front" information as possible prior to conducting fieldwork. Complete the form in as much detail as you can, providing attachments as necessary. Cite the source for all information obtained.

Site name: Textron, Inc.
City, County, State: Augusta, Richmond, Georgia
EPA ID No.: GAD003302064
Person responsible for form: Steve Walker
Date: 5/3/88

Air Pathway

Describe any potential air emission sources onsite: None Known

Identify any sensitive environments within 4 miles:
(Ref. USGS Topo. Map Augusta East) Phinizy Swamp, 3/4 mile east of site
Identify the maximally exposed individual (nearest residence or regularly occupied building - workers do count): any of the businesses which surround the site (See log book for names on site sketch p.1

Groundwater Pathway

Identify any areas of karst terrain: None Known

Identify additional population due to consideration of wells completed in overlying aquifers to the AOC: None

Do significant targets exist between 3 and 4 miles from the site? yes - ~~workers~~ residents utilizing wells south of the site (Ref. USGS Topo. Map Augusta East, and Log Book)
Is the AOC a sole source aquifer according to Safe Drinking Water Act? (i.e. is the site located in Dade, Broward, Volusia, Putnam, or Flager County, Florida) No

M.2 - SITE MAINTENANCE FORM

EPA ID: GAD003302064

SITE NAME: TEXTRON INC SOURCE: H

STREET: MARVIN GRIFFIN RD CONG DIST: 10

CITY: AUGUSTA ZIP: 30906

CNTY NAME: RICHMOND CNTY CODE: 245

LATITUDE: 33/23/49.2 LONGITUDE: 081/59/34.2

SMSA: 0600 HYDRO UNIT: 03060106

INVENTORY IND: Y REMEDIAL IND: Y REMOVAL IND: N FED FAC IND: N

NPL IND: N NPL LISTING DATE: NPL DELISTING DATE:

APPROACH: SITE CLASS:

SITE/SPILL IDS:

RPM NAME: RPM PHONE: - -

DIOXIN TIER: REG FLD1: REG FLD2: 2

RESP TERM: PENDING ( ) NO FURTHER ACTION ( )

ENF DISP: NO VIABLE RESP PARTY ( ) VOLUNTARY RESPONSE ( )
ENFORCED RESPONSE ( ) COST RECOVERY ( )

SITE DESCRIPTION:

* ACTION: _

* _____ _

* _____ __

* _____ _____-____

* _____ ___

* __/__/__._ ___/__/__._

* ____ _____

* _ _ _ _

* _ __/__ __/__

* ___ ___

* __ __ __ __ __

* _____ ___-___-____

* ____ _____ _

* PENDING (_) NO FURTHER ACTION (_)

* _ _

* _ _

* _____

* _____

* _____

* _____

M.2 - PROGRAM MAINTENANCE FORM

* ACTION: _ *

SITE: TEXTRON INC

EPA ID: GAD003302064 PROGRAM CODE: H01 PROGRAM TYPE: * _ *

PROGRAM QUALIFIER: ALIAS LINK : * ___ __ *

PROGRAM NAME: SITE EVALUATION * _____ *

DESCRIPTION:

* _____ *
* _____ *
* _____ *
* _____ *

M.2 - EVENT MAINTENANCE FORM

* ACTION: _ *

SITE: TEXTRON INC
PROGRAM: SITE EVALUATION

EPA ID: GAD003302064 PROGRAM CODE: H01 EVENT TYPE: DS1

FMS CODE: EVENT QUALIFIER: EVENT LEAD: E * _ ___ _ *

EVENT NAME: DISCOVERY STATUS: * _____ _ *

DESCRIPTION:

* _____ *
* _____ *
* _____ *
* _____ *

ORIGINAL	CURRENT	ACTUAL			
START:	START:	START:	* __/__/__	__/__/__	__/__/__ *
COMP :	COMP :	COMP : 80/08/01	* __/__/__	__/__/__	__/__/__ *

HQ COMMENT:

* _____ *

RG COMMENT:

* _____ *

COOP AGR #	AMENDMENT #	STATUS	STATE %	
* _____	_____	__	___ *	

M.2 - EVENT MAINTENANCE FORM

* ACTION: _ *

SITE: TEXTRON INC
PROGRAM: SITE EVALUATION

EPA ID: GAD003302064 PROGRAM CODE: H01 EVENT TYPE: PA1

FMS CODE: EVENT QUALIFIER: EVENT LEAD: S * _ ___ _ *

EVENT NAME: PRELIMINARY ASSESSMENT STATUS: * _____ _ *

DESCRIPTION:

* _____ *
* _____ *
* _____ *
* _____ *

ORIGINAL	CURRENT	ACTUAL			
START:	START:	START: 85/09/17	__/__/__	__/__/__	__/__/__
COMP :	COMP :	COMP : 85/09/17	__/__/__	__/__/__	__/__/__

HQ COMMENT:

* _____ *

RG COMMENT:

* _____ *

COOP AGR #	AMENDMENT #	STATUS	STATE %			
				_____	_____	___ ___

M.2 - COMMENT MAINTENANCE FORM

SITE: TEXTRON INC

EPA ID: GAD003302064

COM NO	COMMENT	ACTION
001	PART A- ON FILE	* _ _____ *
		* _____ *

JOE D. TANNER
Commissioner

J. LEONARD LEDBETTER
Division Director

Department of Natural Resources

ENVIRONMENTAL PROTECTION DIVISION
270 WASHINGTON STREET, S.W.
ATLANTA, GEORGIA 30334

August 16, 1983

Mr. Walton W. Jones
Environmental Scientist
EPA, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear ~~Mr. Jones:~~ Wally

As per our conversation please find enclosed the "Notification of Hazardous Waste Site" form pursuant to CERCLA Section 103(C) submitted by E-Z-Go/Textron in Augusta, Georgia.

If there are any questions, please contact me at 404/656-2833.

Sincerely,

Jim Ussery

Jim Ussery
Environmental Specialist
Industrial & Hazardous Waste
Management Program

BJU:mg:2584B
Attachment
cc: John D. Taylor
Alan Laros

E-Z-GO TEXTRON

E-Z-GO Division of Textron Inc.

P.O. Box 388
Augusta, Georgia 30913-2699
404 / 798-4311

July 26, 1983

RECEIVED
AUG 01 1983
ENVIRONMENTAL PROTECTION DIVISION
LAND PROTECTION BRANCH

Mr. Jim Ussery
Department of Natural Resources
Environmental Protection Division
270 Washington Street S.W.
Atlanta, Georgia 30334

Dear Mr. Ussery:

Enclosed is a completed copy of; Notification of Hazardous Waste Site, as you requested. Also enclosed is a letter from Augusta-Richmond County Planning Commission, concerning wells in the immediate area, along with,a proposal from Applied Engineering and Science for closure of the abandoned chromic facility.

I respectfully submit the above documents, along with this letter, as a request for "Closure" of this abandoned facility.

Should you have any questions concerning the above, please contact me.

Sincerely,
Charlie Grimes

Manager/Plant Engineering

AUGUSTA-RICHMOND COUNTY
PLANNING COMMISSION
DAYTON L. SHERROUSE, AICP
EXECUTIVE DIRECTOR
525 TELFAIR STREET
AUGUSTA, GEORGIA 30901
724-4391, EXT. 237

September 16, 1980

Mr. Daniel Didgeon
E-Z-Go Textron
P. O. Box 388 (13)
Augusta, GA 30913

Dear Dan:

In response to your request, I have checked our records and find no water wells within 1/4 mile of your plant located on Marvin Griffin Road. I also have checked with the Richmond County Board of Health, the Richmond County Water System and the Augusta Waterworks and none of these agencies show any evidence of wells located within the area.

Should you need additional information, please contact me.

Sincerely,

Dayton L. Sherrouse

Dayton L. Sherrouse, AICP
Executive Director

DLS/jg